

ECOTOX User Guide

ECOTOXicology Database System

Version 4.0

Prepared for

U.S. Environmental Protection Agency
Office of Research and Development
National Health and Environmental Effects Research Laboratory
Mid-Continent Ecology Division (MED)
Duluth, Minnesota

By

Computer Sciences Corporation
Duluth, Minnesota
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DISCLAIMER

You should consult the original scientific paper to ensure an understanding of the context of the data retrieved from the ECOTOX database.

ECOTOX attempts to be comprehensive, our searches do not locate all relevant literature. In addition, the time lag from conducting a literature search, acquiring the publication and encoding it into the ECOTOX database can be up to or exceed six months. For this reason, we also suggest that you conduct searches of the most recent publication year to ensure you capture data that has not been entered into the ECOTOX database.

Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the U. S. government.

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INTRODUCTION

In the development and implementation of ecosystem management decisions there is the need to establish scientifically credible risk assessments for chemical stressors. Ecological assessments are required to characterize and diagnose the relative risk of chemical pollutants and to predict future risk as a function of environmental management options.

The U.S. EPA's ECOTOXicology database (ECOTOX) is a source for locating single chemical toxicity data for aquatic life, terrestrial plants and wildlife. ECOTOX was created and is maintained by the Office of Research and Development's (ORD's), National Health and Environmental Effects Research Laboratory (NHEERL) / Mid-Continent Ecology Division (MED).

ECOTOX, developed at the U.S. EPA MED, integrates three previously independent databases - AQUIRE, PHYTOTOX, and TERRETOX - into a unique system which includes toxicity data derived predominantly from the peer-reviewed literature, for aquatic life, terrestrial plants, and terrestrial wildlife, respectively. Not all data published in the peer review ecotoxicology literature are included in ECOTOX. You should refer to the Limitations section of this document to understand test results that are not considered for inclusion in the database.

Researchers or managers using ECOTOX for analyses or summary projects should consult the original scientific paper to ensure an understanding of the context of the data retrieved from ECOTOX.

For more information on the ECOTOX database contact:

ECOTOX Support
U.S. Environmental Protection Agency
Office of Research and Development
National Health and Environmental Effects Research Laboratory
Mid-Continent Ecology Division (MED)
6201 Congdon Boulevard
Duluth, Minnesota 55804
Telephone: 218-529-5225
Fax: 218-529-5003
E-mail: ecotox.support@epa.gov

GETTING STARTED

Access

To access the ECOTOX Web site, you will need a computer equipped with a Javascript enabled World Wide Web browser and a means of connecting to the Internet. Start your browser software and type in the Internet address <http://www.epa.gov/ecotox/> and you will be connected to the ECOTOX home page. ECOTOX has the following browser limitations:

- The query pages require that your browser support JavaScript and this feature must be activated in your browser preferences.
- ECOTOX does not function properly when using Windows 3.1.
- ECOTOX supports Netscape Navigator 4.x (or higher) and Explorer 4.x releases. Older browser versions are not supported and will require an upgrade.
- If you use a popup blocker program, ECOTOX reports, help and browse features will not display. Please add the ECOTOX web site to your popup browser exception list to ensure full usability.

Navigating within ECOTOX

Left Frame

The home page provides a general overview of the ECOTOX database with links to About ECOTOX, Help Center, Quick Database Query, Advanced Database Query, Frequently Asked Questions, Data Download and Eco-SSL Website. These selections will open a new window and not affect any modifications you have made to your ECOTOX search or report selections.

About ECOTOX: This section of the website provides a general overview of the ECOTOX database, including the history of the system's development.

Help Center: Our Help Center describes the ECOTOX web site contents and navigational resources available. Printable help is available in PDF (Portable Document Format) ECOTOX User Guide 4 and ECOTOX Code List. To ensure you will be able to see a PDF file in its entirety, please obtain the most recent edition of the free Acrobat Reader from Adobe (www.adobe.com). The help center resources are located in one of four web pages:



A brief description of each help file is presented below:

Starting Out - Find information on how to begin navigating and searching the ECOTOX Web site. This page also provides links to the Limitations associated with the ECOTOX database, frequently asked questions, recent additions, and PDF versions of the ECOTOX User Guide (this document), and the ECOTOX Code List, which provides detailed information regarding codes presented in the aquatic and terrestrial reports.

How do I... - How to perform your search and retrieve output in ECOTOX.

What is... - Lists and provides links to descriptions and codes for each field available within ECOTOX searches and output. Includes links to the ACQUIRE and TERRETOX coding guidelines and full list of ECOTOX Codes used by the ECOTOX staff. For a brief overview of coding practices used within ECOTOX see Appendix C.

More Resources - Other useful aids within ECOTOX and related resources on the World Wide Web. Providing these links does not imply endorsement by the U.S. EPA.

Quick Database Query: The Quick Query form allows a simple search for a limited number of chemicals, species, effects and publication years.

Advanced Database Query: The Advanced Database Query is menu driven and uses navigation links to direct you through multiple search criteria pages. The Advanced Database Query utilizes all available search and output features.

Limitations: The following restrictions are placed on ECOTOX data. Data not satisfying these requirements are excluded from the ECOTOX databases: You should review the limitations of ECOTOX data retrieval and system requirements prior to performing searches this site.

- The author(s) must report valid species and chemical information. If the ECOTOX staff cannot verify the species Scientific and common names or locate the chemical's Chemical Abstract Services (CAS) Registry number, the data record is not included in the database.
- Only single chemical exposures are included in ECOTOX, therefore results for chemical mixtures are excluded.
- The author(s) must identify the exposure duration associated with the observed effect.
- Bacteria and virus studies are not included.
- The author(s) must report either a chemical concentration or application rate and the associated observed effect.

- *In vitro* and vapor exposures are not included in the ECOTOX database.
- Toxicity test data for chemical exposures where only sediment concentrations are reported are excluded from the aquatic database.
- In general, tests conducted with petroleum (fuel oils) and air pollution (CO₂ and ozone) chemicals are excluded from ECOTOX.

In addition, ECOTOX currently has limits on the number of data records that can be retrieved:

- There is a maximum number of 500 full records and 5000 tabular records that can be retrieved in one browser-viewable report. The delimited export file will retrieve up to 10,000 records.

Frequently Asked Questions: The Frequently Asked Question page provides quick access to typical questions we receive.

Data Downloads: You can download delimited ASCII files of the entire aquatic or terrestrial raw data. This does not include any software and will require reconstructing various files together in order to view entire data records. The data are divided into two sections; aquatic and terrestrial. Within these sections you will find data tables, field descriptions and graphical relations of the data structure.

Browse Chemicals: Locate ECOTOX chemicals available for searching. You can search by CAS Registry number or by chemical name, including synonyms. The Browse Chemicals links are also available above the Chemical Entry selection box to use prior to searching. This feature helps you locate the best input format to enter in the entry box.

Browse Effects: Find effect measurement codes and definitions located within ECOTOX. The Browse Effects links are also available above the Effect Entry selection box to use prior to searching. This feature helps you locate the best selections for effects and measurements.

Browse Species: Locate ECOTOX species available for searches. You can search by common name, Scientific Name or ECOTOX species number. The Browse Species links are also available above the Species Entry selection box to use prior to searching. This feature helps you locate the best input format to enter in the entry box.

Eco-SSL Website: The Eco-SSL (Ecological Soil Screening Level) web site provides links to summary documents presenting risk-based ecological soil screening levels for many of the soil contaminants frequently of concern during ecological risk assessments at hazardous waste sites. This site is maintained by the ECOTOX support staff, and was developed by the U.S. EPA's Office of Emergency and Remedial Response. The site

also includes links to all procedures used in deriving the Eco-SSL, background and discussion documents, and lists of all literature acquired under this effort.

Contact Us: If you have a question that can't be answered through our help, please contact us with your question. This link also appears on the top frame of every ECOTOX web page.

From the home page, you may select one of two ways to search ECOTOX. The Quick Query form allows a simple search for a limited number of chemicals, species, effects and publication years. The Advanced Database Query is menu driven and uses navigation links to direct you through multiple search criteria pages. The Advanced Database Query utilizes all available search and output features.

To conduct a search, click on either the "Quick Database Query" or "Advanced Database Query" option from the home page. The search query page will then load. If you want to go from one database query option to the other, you will lose your current search strategy.

Top Frame

Selecting any of the following options will open a new window, and not affect any modifications you have made to your ECOTOX search or report selections.

Recent Additions: This link provides information on recent data updates (typically done three to four times per year), and changes to the functionality of the web site.


Contact Us: If you have a question that can't be answered through our help, please contact us with your question. This link also appears on the top frame of every ECOTOX web page.

Print Version: The Print Version hotlink will remove the left sidebar and header text at the top of the page. You can use your browser print options to print the displayed page.

OVERVIEW OF SEARCH OPTIONS

Database searches can be conducted using either a Quick or Advanced Database Query menu. The Quick Database Query supports searches on taxonomic kingdom, species common or Scientific name, CAS Registry number or chemical name, observed effect group and publication year. The Advanced Database Query menu includes all options under Quick Database Query, and enables you to focus on more specific criteria such as study site type (e.g., laboratory, field), exposure media (e.g., freshwater, soil), route of

chemical exposure (e.g., oral, diet), and statistically-derived endpoints (e.g., LD50, NOEL). Search results can be downloaded either as a Microsoft (MS) Excel spreadsheet, an ASCII delimited file format, which can be transferred into a database or spreadsheet, or in a browser viewable report format.

When you are within any Quick or Advanced Database Query page and click on a , context-sensitive help will display in a separate window. You may navigate within the help window without affecting your search session.

Search Strategy Basics


The search pages are designed to search on all data, unless you restrict the search by adding search criteria (e.g., adding the check in the check box, enter text in a text entry field). You may perform the search at any time after you have specified your search criteria. You do not need to enter something in every search criteria area.

The search logic includes two basic strategies, combination/union and intersection. Within a search area (e.g., chemical), the search will combine all your search selections. Between each search area, the search will intersect your selections (e.g., intersection between chemical and taxonomic selections). You may also want to use the ECOTOX Search Planner located in Appendix A to plan your searches. Appendix B describes practice searches to assist you in using the ECOTOX system.

Before searching, you should read Appendix C to find out more about the ECOTOX database and Appendix E for specific data field descriptions.

Overview of Query Page Functions


Moving Within Pages and Target Menu

You may need to move within an ECOTOX screen by using the scroll bars located at the right and bottom of your computer screen. The right scroll bar moves up and down, the bottom moves left and right. There are also “Go to Top” buttons  located strategically throughout the page that will take you back to the top menu.

You can also navigate within the page using the menu located at the top of each page by clicking on the desired hyperlink. This will move you to your requested location within the same page.

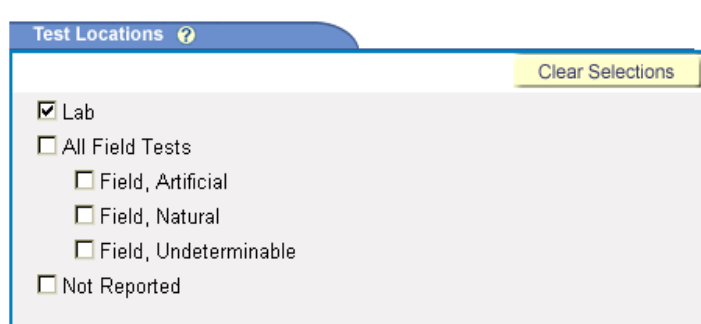
To narrow your search, use one or more of the following options: [Chemical](#) or [Species](#) or [Effects](#) or [Publication Years](#) or [Report Format](#)

Selection Box and Types

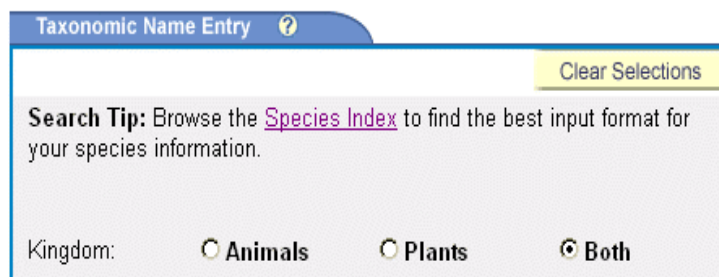
All search and report selections will be displayed in a box using multiple selection methods (radio button, checkbox, drop-down lists, typing in text (one entry per line)). Each search selection box is labeled and a question mark graphic . When you click on this icon, context-specific help is presented. Each box also includes a Clear Selections button in the right-hand corner of the box. When you click on Clear Selections all selections within the box are removed.

Search selection types include:

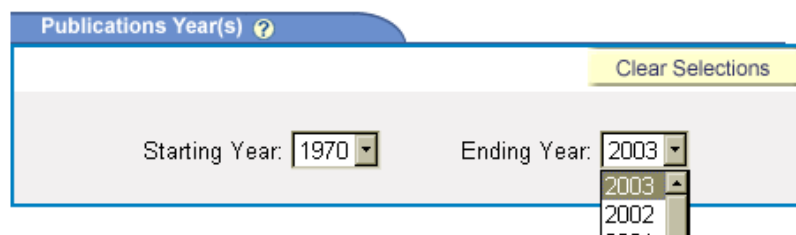
Checkbox: To select an item, click on the check box you want to include. To remove a selection, click on the checkbox again. You can select one or more items.



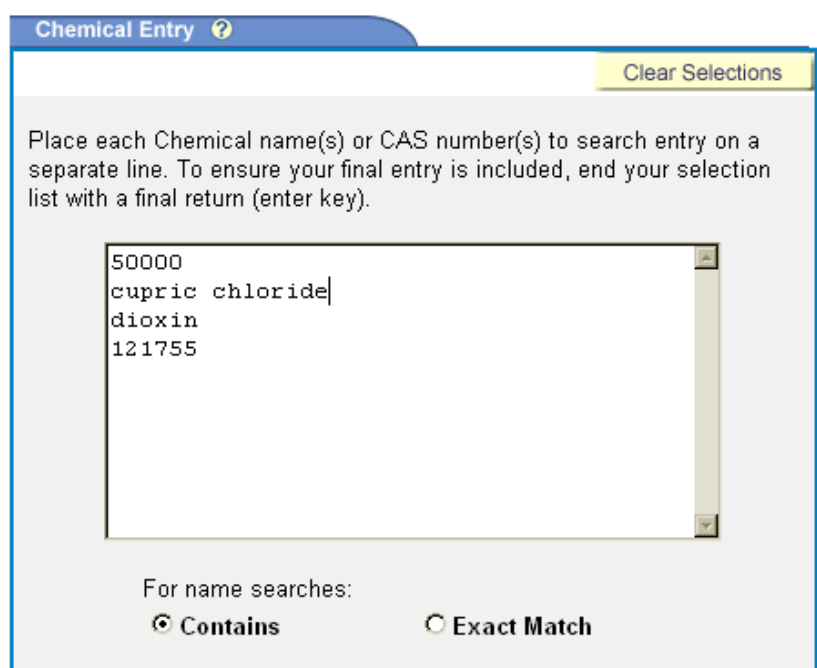
Radio button: To select an option, click on the radio button box you want to include. To unselect, click on the radio button again. Only one option listed can be chosen.



Drop-down List: To modify searches using the drop-down list, click on the arrow icon on the right side. Clicking on this icon drops down a list immediately below the field and shows which values can be chosen. Click on the entry item you want selected.



Text Entry Chemical, Species and Reference Number searches require typing the search criteria into the selection box. Each entry must be on a single line, followed by a carriage return. The text you type must match the type of data within ECOTOX, either as a sub-string search (Contains) or exactly (Exact Match). All numeric entries will be searched exactly as entered, without selecting the Exact Match radio button. You may enter both text and numeric data into text boxes.



The screenshot shows a web-based search interface titled "Chemical Entry" with a help icon. A yellow button labeled "Clear Selections" is in the top right. Below the title, instructions state: "Place each Chemical name(s) or CAS number(s) to search entry on a separate line. To ensure your final entry is included, end your selection list with a final return (enter key)." A text input area contains the following entries: "50000", "cupric chloride", "dioxin", and "121755". At the bottom, under the heading "For name searches:", there are two radio buttons: "Contains" (which is selected) and "Exact Match".

Quick Database Query

The Quick Database Query search and report options are located within a single web page, therefore you can use your scroll bar or the target menu to move around the page in order to make selections.

The Quick Database Query supports searches on Chemicals (Names or CAS Registry numbers), Species (Kingdom, Scientific or common names), major Effect group (with restriction for presenting only those results with calculated Endpoints) and Publication Year(s). All report formats are available within the Quick Query menu, but you cannot modify the sort order or data field display within the report. The search options within the

Quick Database Query are available in the Advanced Database Query, but the Advanced Database Query screens afford more search and output options.

When constructing your searches, remember that for the text entry forms (Chemical and Taxonomic) each entry must be on a single line, followed by a carriage return. The text you type must match the type of data within ECOTOX, either as a sub-string search (Contains) or exactly (Exact Match). All numeric entries will be searched exactly as entered, without selecting the Exact Match radio button. You may enter both text and numeric data into text boxes. For radio button screens (e.g., Report Format), you may only make one selection within a grouping. For checkboxes (e.g., Effect Measurements) you may make multiple selections.

Key Functions

Each of the Quick Database Query pages includes the Key Functions box located in the upper right corner of the page. These Key Functions include:

Restore Defaults - Erases previously selected search criteria on all search pages and restores the default report format.

Perform Query on Aquatic Data - Activates your search and displays aquatic report results in a separate window

Perform Query on Terrestrial Data - Activates your search and displays terrestrial report results in a separate window

Search Options

You must search on at least one parameter. Any selections made using multiple parameter search boxes (i.e., excluding the Report Format) within the Quick Database Query page will narrow the search result. ECOTOX offers the following Quick Database Query options:

- Chemical Within the Chemical Entry search box, you may search on chemical(s) using either CAS Registry numbers, or chemical names.
- Taxonomic Within the Taxonomic Name Entry search box, you may search on Kingdom (plant vs. animal), taxonomic information using either the scientific name (e.g., phylum, genus, species), common name, or ECOTOX species number to identify the organism(s) or taxonomic group of organisms. You must identify whether the search is for a genus/species scientific name, common name, or other taxonomic name.

- Effect Measurements Within the Effect Measurement search box, you may search on major effect groups (e.g., mortality, bioaccumulation). You may also restrict your search results to studies that report only calculated Endpoints (e.g. EC50).
- Publication Year(s) Within the Publication Year(s) search box, you may select to search on a range of Publication Years.
- Report Format Within the Report Format search box, you may select another Report Format (e.g, tabular browser viewable, MS Excel, Delimited, or full data record). The default is set to a tabular browser viewable format for aquatic reports, and the full data record for terrestrial reports. See Appendix G for examples of the default report formats.

Advanced Database Query

Functions Unique to the Advanced Query

Page Navigation Tool Bar: The Advanced Database Query are of the ECOTOX web site is designed to lead you through a search session using multiple forms. Each page provides a menu and navigational drop-down sub-menus that will take you to various locations within the Advanced Database Query pages. At the top of each Advanced Database Query page, is the Page Navigational Tool Bar that provides links to the various pages. You must use the navigation tool bar to move from page to page within the Advanced Database Query. Using your browser's Back button will result in the loss of all entries made in any of the ECOTOX forms.



Search or

report options within each web page include:

Main - Describes search and report features available within ECOTOX.

Taxonomic -Taxonomic Entry, Predefined Taxonomic Groups

Chemical - Chemical Entry, Predefined Chemical Groups

Test Results - Endpoints, Effects and Measurements

Test Conditions - Test Location, Exposure Media, Exposure Type, Chemical Analysis

Publications/Updates - Reference Number, Publication Year, Independently Compiled Data and Recent Modifications/Additions

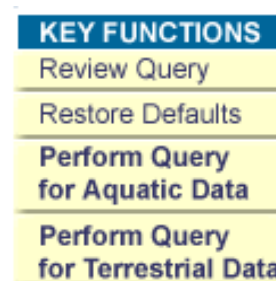
Key Functions: Each of the Advanced Database Query pages includes the Key Functions box located in the upper right corner of the page. These Key Functions include:

Review Query - View your search criteria and report format.

Restore Defaults - Erases previously selected search criteria on all search pages and restores the default report format.

Perform Query on Aquatic Data - Activates your search and displays aquatic report results in a separate window.

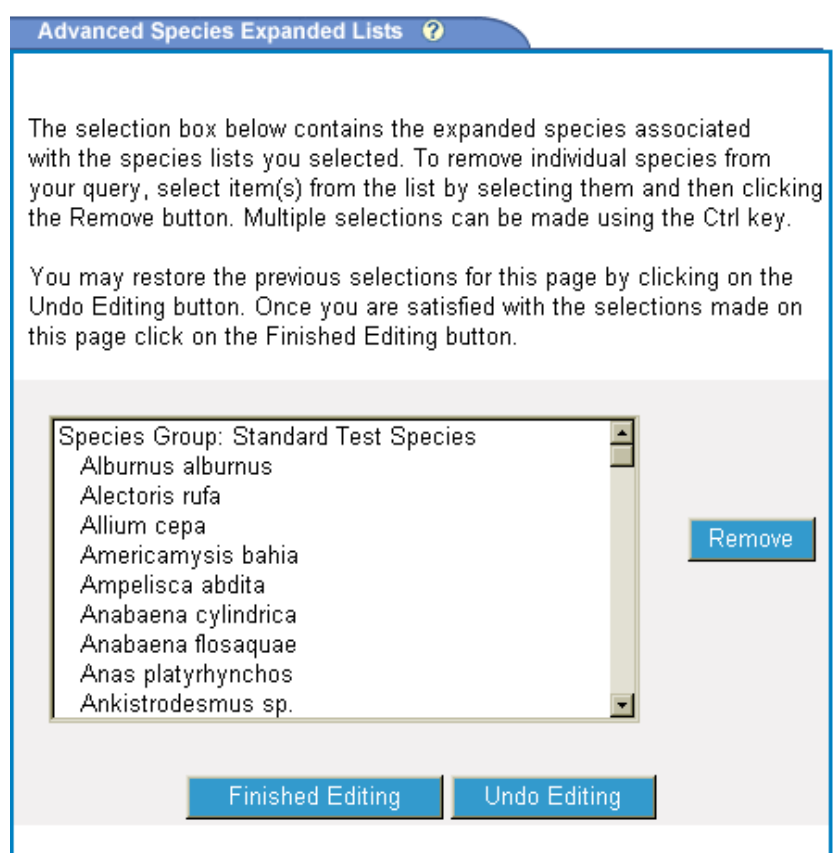
Perform Query on Terrestrial Data - Activates your search and displays terrestrial report results in a separate window.



Advanced Database Query View/Edit: For predefined lists within the Chemical, Taxonomic, and Effect Measurements search windows, you can view and/or further edit your selected lists. To access the view and edit feature, click on the button located at the bottom for the search box labeled, View/Edit List Entries. This will redisplay the details of the list(s) you selected. If you are viewing and do not want to make any changes, click on the Finished Editing button. This will return you to the previous page.

If you want to remove selection(s), select the items by highlighting or clicking on the item, then click on the Remove button. Multiple selections can be made by holding the Ctrl key down while clicking the item. You may restore the default selections by clicking on the Undo Editing button. When your editing is complete, click on the Finished Editing button to return to the previous page.

If you click on your browse "Back" button, your edits will not be saved.



Search Options

The Advanced Database Query option provides a broader range of search parameters than available in the Quick Database Query page. The default for each selection box is all data will be searched. As you add selections to your search criteria, the number of records that can be retrieved from the ECOTOX database may be reduced.

For the Advanced Database Query, the Chemical and Taxonomic pages, any entries selected on the page combines selections into a single query. For example, if you select the species *Daphnia magna* and Predefined Species Group "Fish", the result will be the combination of all fish species and the *Daphnia magna* species.

You must search on at least one parameter. Any additional selections made from other search parameter menus (i.e., not Report Format) within the Advanced Database Query pages will narrow the search result. ECOTOX offers the following search options:

- Advanced Database Query Main Menu: This web page provides an overview of how to navigate within the Advanced Database Query pages. Each Advanced Database Query page will have a navigational tool bar located at the top of the page, which will

allow you to move to different search parameters (Taxonomic, Chemical, Test Results, Test Conditions, Publications/Updates) and to customize your final ECOTOX output (i.e., Report Format).

- Taxonomic Within the Taxonomic page, you may search on one or more Predefined Taxonomic Groups or enter your own list of taxonomic information using either the scientific name, common name or ECOTOX species number to identify the organism(s).
- Chemical Within the Chemical page, you may search on one or more Predefined Chemical Groups or enter your own list of chemicals using either the Chemical Abstract Services (CAS) Registry number or chemical name to identify the substance(s).
- Test Results Within the Test Results page, you may search on calculated Endpoints (e.g. EC50), observed Effects (e.g., growth), and/or specific Effect Measurements (e.g., weight).
- Test Conditions Within the Test Conditions page, you may search on Test Locations (e.g., laboratory, field), Exposure Media (e.g., freshwater, soil), or Exposure Types (e.g., static, diet), and /or Chemical Analysis (measured vs. unmeasured).
- Publications/Updates Within the Publications/Update page you may search on Publication Year, ECOTOX Reference Number(s), Independently Compiled Data Sets (e.g., USGS Acute Toxicity Databases) that are submitted electronically by collaborators, and/or the last six ECOTOX Modifications/Updates.
- Report Format Within the Report Format page, you may select another Report Format (e.g, browser viewable, MS Excel, Delimited) or customize your report by modify the Aquatic Output Selection and/or the Terrestrial Output Selections.
- Key Functions At any time after you have made selections, you may review your search selections (Review Query), clear any selections you made within any Advanced Database Query page, (Restore Defaults), or generate your search results (Perform Query for Aquatic Data, Perform Query for Terrestrial Data).

CONDUCTING A QUERY WITHIN ECOTOX

Taxonomic Searching

Within ECOTOX you may conduct a search by entering the Species Number(s), Genus/Species Name(s), Other Taxonomic Name(s) or Common Name(s). To browse Species Numbers, Genus/Species Names, or Common Names available in the database, click on the Browse Species index link on the left frame or within the Taxonomic Name Entry box. All data records within ECOTOX include a Scientific name for the test species. All names have been verified in reliable taxonomic sources. Appendix D contains information regarding the verification of species data in ECOTOX.

The ECOTOX species file includes historical synonyms for the species. If a search is conducted using a species name that is noted as a taxonomic synonym in our system, ECOTOX database will present the results using the currently acceptable genus and species name.

Taxonomic Entry

To conduct a search, type in the taxonomic name, common name or Species number and select the appropriate data type radio button. Partial taxonomic names may be used when the Contains radio button is selected. The Exact Match selection is used when you want only the exact text entered to be searched.

You can search for an unlimited number of entries and each entry must be entered on a separate line. You can mix numbers and name entries, but the name entry must be the same type (e.g., Genus/species and Common names cannot be searched within one entry screen). If you select the Contains radio button, the data retrieved will include species with names having any part of the words given in the text box (i.e., a search on the word *daphnia* will return both *daphnia* and *ceriodaphnia*).

Browse Species Index: Within the Taxonomic Entry box is a link to the Browse Species Index. By clicking on the Browse Species Index hotlink above the search box, a new browser window will open to access to the ECOTOX species information file. This can assist you in planning your taxonomic search strategy by allowing you to enter different Genus/Species, other taxonomic levels and common species names or name sub-strings to determine whether or not your species is in the ECOTOX database and what other species will be included if your sub-string is used. For example, by entering the species Scientific name '*Ceriodaphnia reticulata*', the following species numbers and Scientific names will be included in your search results:

<u>ECOTOX Species#</u>	<u>Genus/Species Name</u>
963	<i>Ceriodaphnia reticulata</i>
2371	<i>Ceriodaphnia dubia</i> - <i>Ceriodaphnia reticulata dubia</i> (<i>Historical Name</i>)

You can then use the names provided in the output to perform your searches, or use the species numbers listed by each name.

Genus/Species Name: You can conduct a search on whole or fragments of scientific names (genus, species). ECOTOX includes information about species synonyms within the Browse Species Index file.

Other Taxonomic Names: Key taxonomic levels (Kingdom, Phylum, Class, Order, Family) searches are available by typing the appropriate scientific name. ECOTOX includes information about taxonomic levels within the Browse Species Index file.

Species Common Name: All data records within ECOTOX include a common name for each species. You can conduct an exact search (Exact Match) on the common name or fragments (Contains) of common names by selecting the proper radio button option below the entry box.

Species Number: All species in the ECOTOX database have been assigned a unique number. Numbers can be located by using the Browse Species Index option. You can include numbers and text information (either Scientific or common names in one search. Species numbers are always searched as an exact match.

Predefined Taxonomic Groups (*Advanced Query Only*)

The option to select from predefined lists is only available in the Advanced Database Query. Species lists have been provided to effectively search a variety of species groups.

You may remove and/or view the individual species within a list by clicking on the View/Edit List Entries button located directly below the Species Group check boxes. See the section on "Using View/Edit List Entries" if you need help viewing and/or editing species lists. You cannot display the Animal and Plant species groups due to the large number of species within these lists.

Taxonomic kingdom (plant or animal) searching is available on both the Quick and Advanced Database Query pages. The kingdom is searched using a radio button option in the Quick Database Query search. The kingdom search in the Advanced Database Query is located within the Predefined Taxonomic Groups as "All Plants" for the plant kingdom or "All Animals" for the animal kingdom.

The plant kingdom search also includes species representing Monera and Fungi. Some test results report both plant and animal species as one effect measurement (e.g., aquatic community, plankton, soil community). These results will be included when either plant, animal or both kingdoms are selected.

ECOTOX includes the following Predefined Taxonomic Groups:

Animals: This list is broken into the following sub-groups:

- | | |
|-----------------------|---------------|
| • Amphibians | • Mammals |
| • Birds | • Molluscs |
| • Crustaceans | • Reptiles |
| • Fish | • Worms |
| • Insects/Spiders | • All Animals |
| • Other Invertebrates | |

Plants: This list is broken into the following sub-groups:

- Algae, Moss, Fungi
- Flowers, Trees, Shrubs, Ferns
- All Plants

Specials Interest:

- Standard Test Species
- U.S. Threatened and Endangered Species
- U.S. Exotic / Nuisance Species

Example Taxonomic Search

The example below is the correct method of entering query text. You can enter a mix of numbers and species terms. Number will always be treated as exact matches by the ECOTOX query. When mixing genus/species (e.g., *Oncorhynchus mykiss*) and fragments of taxonomic names (e.g., *Daphnia*), select the Contains button when searching, even when numbers are entered.

Example Genus/Species Name Query

Pimephales promelas
Daphnia
Salmo
2371
Oncorhynchus mykiss

For name searches	
<ul style="list-style-type: none"> ● Genus/Species Name ○ Other Taxonomic Names (>=Family) ○ Species Common Name ○ Species Number 	
● Contains	○ Exact Match

If you are storing your species records in another source (like a spreadsheet), you may cut and paste the values into this box just like any other Windows application. For example, taking the information from an MS Excel spreadsheet you would:

1. Highlight all of the items in a spreadsheet column (please keep it to one column of data).
2. Press CTRL+C (or select Copy under the Edit Menu).
3. Bring up the Advanced Database Query page.
4. Click in the Text Box (so the cursor is blinking in the box).
5. Press CTRL+V (or select Paste under the Edit Menu).
6. Press "Enter" key to place a hard return at the end of the list to ensure the last row is included in the search.

Search Tips for Taxonomic Searches

By clicking on 'Taxonomic' on the menu at the top of the search page, you will move to the Taxonomic Search area. Some examples are provided to help when developing your search strategy:

Scientific Name - Genus/Species: Entering *Pimephales promelas* in the search text box will result in only data for fathead minnows. Entering *daphnia* genus as the genus/species name will result in all *Daphnia* and *Ceriodaphnia* species. If you consistently use genus and/or species names, you may want to use the species number for searching.

You may also enter a historical Scientific name and still retrieve data for a species. For example, if you enter *Salmo gairdneri* and retrieve the data, the output will display the currently accepted name, *Oncorhynchus mykiss*.

Scientific Name - Other Taxonomic Name (>=Family): You can enter any taxonomic level (Kingdom, Subphylum, Phylum (Division), Superclass, Class, Order, Family, Genus) in this Taxonomic Entry box. For example, you can type in *salmonidae* to retrieve all species for this family. Using a taxonomic name may be helpful when interested in a broader search. Please check the Browse Species Index to locate the exact taxonomic hierarchy used in ECOTOX.

Species Common Name: Using some common names may be an effective way to search if there is a unique common name for that organism. For example, entering *mallard* in the common name field will result in only mallard duck results.

However, entering the term *duck* will output results for *duck* and *duckweed*. In this case, searching using the common name (exact) or performing only performing the query on terrestrial data will eliminate the duckweed from the search.

Entering *bird* in the common name field will result in *bird* and *ladybird beetle* data. In addition, using the term *bird* will not ensure that all bird data in the system will be extracted because the species name may not use the term *bird* in the common name.

Species Number: The species number is the unique indexing number assigned to each species in ECOTOX and can be used as a shortcut method to search genus and/or species data. The species number may be useful if you consistently search on the same set of species. The best way to determine species numbers is to access the Browse Species feature.

Chemical Searching

Using the Chemical search page, you can conduct queries on CAS Registry numbers, partial or complete chemical names, and predefined groups of chemicals. The default within ECOTOX is that all chemicals are selected for searching. All chemicals within ECOTOX include a CAS Registry number and a chemical name, typically a Collective Indices name. This information is verified in reliable sources. Appendix D describes the verification process for chemicals in the ECOTOX system. The Collective Indices name is identified as the preferred name within the ECOTOX database, and this is the name that will be displayed on your report even if your search was conducted using a common or trade name of a substance.

ECOTOX does include chemical synonym searching. If a synonym is used by more than one CAS number, both chemicals will be queried. If the database located more than one CAS number for your chemical entry, a warning message will display at the top of your browser viewable reports. (Example, "Warning! Your chemical name "chlordane" produced a search on more than one chemical. All chemicals, CAS numbers, 57749 and 12789036, are included in your report"). No warnings will display in MS Excel or delimited output.

Chemical Entry

To conduct a search, type in the CAS Registry number(s) and/or chemical name(s), and select the appropriate data type radio button (i.e., Contains vs. Exact Match). Partial chemical names may be used when the Contains radio button is selected. The Exact Match selection is used when you want only the exact text entered to be searched. CAS Registry numbers are always treated as exact entries even when Contains is selected.

You can search for an unlimited number of entries and each entry must be entered on a separate line. You can mix numbers and name entries. If you select the Contains radio button, the data retrieved will include chemicals with names having any part of the words given in the text box (i.e., a search on the word *chlordan*e will return both *chlordan*e and *oxychlordan*e).

Browse Chemical Index: Within the Chemical Entry box is a link to the Browse Chemical Index. By clicking on the Browse Chemical Index hotlink above the search box, a new browser window will open to access to the ECOTOX chemical information file. This can assist you in planning your chemical search strategy by allowing you to enter different CAS Registry number(s), or name sub-strings to determine whether or not your chemical is in the ECOTOX database and what other chemicals will be included if your sub-string is used. You can then use the chemical names provided in the output to perform your searches, or use the CAS Registry numbers listed by each name.

The Browse Chemical search result provides a list of the CAS Registry number(s) and all instances where your text string was included in a chemical name in the ECOTOX index file. For example, if you were to enter 'xylene' as a chemical string within ECOTOX, the following chemicals would be included in your search result:

<u>CAS#</u>	<u>Chemical name</u>
81152	Trinitro-t-butyl xylene
89587	Nitro-p-xylene
881992	alpha,alpha'-Hexachloro-xylene
1074244	2,5-Dibromoxylene
1330207	Xylene
13209159	a,a,a',a'-Tetrabromo-O-xylene

You can then either use the resulting chemical names in your search or conduct your search using the CAS Registry numbers that are displayed using the Browse Chemicals index. The output under the Browse Chemical Index, provides a list of synonym for the chemical of interest, and a list of physical /chemical properties. Currently the ECOTOX database does not include the physical / chemical property information, but plans are to include it in the next version of the database.

CAS Registry Number: Enter the CAS Registry number(s) you wish to search on, placing each number in a separate field in the CAS Registry numbers section. You may

enter the CAS Registry number with or without hyphens and leading zeros. CAS number queries are always exact matches.

Chemical Name: ECOTOX now includes searching based on chemical synonyms. Enter the names of the chemicals you wish to search on, placing each name in a separate field. After entering all chemical names, identify whether you want to search on the exact name (Exact Match) or on a substring (Contains). For example, if you enter the term *benzene* selecting the Exact Match radio button, you will only search for the specific chemical benzene, not benzene derivatives. It is recommended that you search on CAS Registry numbers, when you want to specifically restrict your search to selected chemical(s).

Predefined Chemical Groups (*Advanced Query Only*)

The option to select from predefined lists is only available in the Advanced Database Query. Chemical lists have been provided to effectively search a variety of chemical groups. To select a chemical group, click on the check box you want to search. To unselect, click on the checkbox again.

You may remove and/or view the Individual chemicals within a list by clicking on the View/Edit List Entries button located directly below the Chemical List check boxes. See the section on "Using View/Edit List Entries" if you need help viewing and/or editing chemical lists.

The following Predefined Chemical Groups are available:

Metal or Organometal Compounds:

- | | |
|-------------|-------------|
| • Aluminum | • Lead |
| • Antimony | • Manganese |
| • Arsenic | • Mercury |
| • Barium | • Nickel |
| • Beryllium | • Silver |
| • Cadmium | • Organotin |
| • Chromium | • Selenium |
| • Cobalt | • Vanadium |
| • Copper | • Zinc |
| • Iron | |

Organic Compounds:

- Dibenzofurans
- Glycol Ethers
- Nitrosamines
- Phthalate Esters
- PAHs (Polyaromatic Hydrocarbons)
- PCBs (Polychlorinated Biphenyls)

Example Chemical Search

The example below is the correct method of entering query text.

<input checked="" type="radio"/> Contains	<input type="radio"/> Exact Match
99865 Cadmium chloride 99898 Metolachlor Malathion 100027	

If you are storing your chemical records in another source (e.g., spreadsheet), you may cut and paste the values into this box just like any other Windows application. For example, taking the information from a MS Excel spreadsheet you would:

1. Highlighting all the items in a spreadsheet column (please keep it to one column).
2. Press CTRL+C (or select Copy under the Edit Menu).
3. Bring up the Advanced Database Query page.
4. Click in the Text Box (so the cursor is blinking in the box).
5. Press CTRL+V (or select Paste under the Edit Menu).
- 6 Press "Enter" key to place a hard return at the end of the list to ensure the last row is included in the search.

Search Tips for Chemicals

Some guidance when conducting a chemical search:

Metal Compounds: It may be more effective to search metal compounds by chemical name. Suppose you want to search for copper compounds. Entering *cupr* and *copper* as chemical names will find copper and several copper compounds with fewer keystrokes than typing all the individual CAS Registry numbers. You may also search a group of copper compounds using the ECOTOX Predefined Chemical Group option.

Organic compounds: These compounds may be searched by chemical name. Suppose you want to search on all dioxin compounds. Entering *dioxin* as a chemical name will be more efficient than entering all the specific dioxin chemical names or CAS Registry numbers. Remember, though, entering some chemical names may identify many non-applicable chemicals (e.g., benzene will result in all compounds with the sub-string 'benzene' in the chemical name). It is recommended to use the chemical's CAS Registry number or the Exact Match option for chemical names that would produce a search result with data records for multiple non-relevant chemicals.

Pesticides: Pesticides are usually found by typing the common synonym name or trade name. Chemical CAS Registry numbers may also be located in chemical company catalogs or other chemical indexing resources. If you are unsure of a CAS Registry number or chemical name, you should use the Browse Chemicals Index to search on chemical names or fragments of names.

Test Results Searching

For each toxicity test record, pertinent information on test results presented by the authors are encoded within the database. This web page contains search selection boxes related to test results for endpoints and effects.

Browse Effects

Browsing the ECOTOX effects file can be used to locate effect measurements groupings or to locate full names for the three/four letter codes presented in the ECOTOX reports. To quickly locate codes within the Browse Effects Index window, you may conduct string searches by clicking the Web browser software Edit menu on the top browser window, and selecting Find in Page. You may also press the CNTRL and F keys simultaneously to bring up the Find in Page option. A PDF version of codes used in the ECOTOX database is located under the "Starting Out" section of the Help Center web page via the hotlink ECOTOX Code List.

Endpoint (*Advanced Query Only*)

The default within the ECOTOX database is that all endpoints are selected for searching. Endpoint information is coded if it is reported by the author. For the purposes of ECOTOX, an endpoint is defined as the quantification of an observed effect obtained through statistics or other means of calculation for the express purpose of comparing equivalent effects (e.g., LC50). Many terrestrial plant tests do not have associated endpoints. Prior to 1996, the terrestrial plant database (PHYTOTOX) structure allowed only results based on percent change from control.

Quick Database Query: Within the Effect Measurements box, you can select to include all data or restrict data to the author reported endpoints (e.g., LC50, LOEC, BCF) using the radio button, Report Endpoints Only. To conduct a search on a specific endpoint you must go to the Endpoint search, under Test Results page, in the Advanced Database Query.

Advanced Database Query: Within the Endpoints box on the Test Result query page, you can click on one or more endpoints within the checkbox to select endpoints to include in your query. The following category of endpoints are included in the ECOTOX database:

- Concentration-Based Endpoints: LC/LDxx, EC/EDxx, ICxx, LOAEC/LOAEL, NOAEC/NOAEL, MATC, LETC, LETH, ZERO
- Time-Based Endpoints: LTxx, ETxx, T $\frac{1}{2}$
- Bioaccumulation / Bioconcentration factor: BCF, BAF, LRxx
- Studies without Endpoints reported

Effect Measurements (*Advanced Query Only*)

The default within the ECOTOX database is that all effects are selected for searching. For ECOTOX database purposes, effect is defined as the observation of a response resulting from the action of a chemical stressor (e.g., mortality). Currently ECOTOX requires that effect information be provided by the author(s) in order for the test to be included in the ECOTOX database, but historically studies with calculated endpoints that did not clearly define the observed effect were included in the database (e.g., EC50 presented, but observed effect not clearly identified). All effects are categorized into one of 11 major effect groupings:

- Accumulation
- Behavior
- Biochemical
- Cellular
- Ecosystem
- Growth
- Mortality
- Physiology
- Population
- Reproduction
- Endpoint Not Reported

You can conduct a search on one or more group effects in both the Quick and Advanced Database Query. To refine your search to include specific effects or effect measurements, you must go to the Effect Measurement search within the Advanced Database Query and select the desired effect(s).

Each effect includes a list of observed measurements. For instance, the Effect Group *biochemical* includes three effect categories: *biochemical*, *enzyme*, and *hormone*. Within each of these effects there are multiple measurements. For example, within the effect *enzyme*, using the Advanced Database Query, you could select to search on results associated with the measurement of a specific enzyme such as *estradiol sulfotransferase*.

Use Browse Effects or the ECOTOX Code List (PDF) located in the “Starting Out” section of the Help Center in order to identify Effect Groups and associated effect measurements. Also, within the Effect Measurement search window, you can view the expanded list of measurements for selected effects or effect groups by clicking on the View/Edit Effect Measurement.

Effect Group: The ECOTOX database categorizes all observed effects under at least one of ten major effect group codes (accumulation, behavior, biochemical, cellular, growth, mortality, physiology, population, reproduction, and ecosystem). The option to select based on an effect group is available in both the Quick Database Query and Advanced Database Query. A limited number of test records report calculated endpoints, but the authors do not specifically state the observed effect. These records are included in the “No Effect Group.” By clicking on the major effect group box, you select all effects under that grouping. To select an individual effect, click on the appropriate effect selection box. To remove any selection, click on the selected checkbox.

Effect Measurement (Advanced Database Query only): For further refinement of observed effect information, you may click on the View/Edit Effect Measurement button

located at the bottom of the Effect Measurement selection box. A new window will open and display the list of specific measurements for each of the selected effect(s) and/or effect group(s). Measurements include quantitative observations that describe and evaluate biological responses to toxicants. Each effect (e.g., Growth) can have several associated measurements (e.g., length, weight). The ECOTOX Code Appendix located in the "What is.." section of the Help Center web page provides definitions of the effect measurement codes used in ECOTOX.

The View/Edit Effect Measurement window allows you to view and edit effect measurements to include in your search for each effect and/or effect group. To remove a specific measurement, highlight the measurement in the list by clicking on it, and click on the Remove button. You may select more than one measurement at a time by holding down your Ctrl key and using your mouse to move up or down the list and clicking on Remove button. You may restore measurements by clicking on the Restore default button. If you do not edit any of the measurements, a search will be conducted on all measurements i.e., those associated with effects and/or effect groups you have previously selected. When you are done, you may click on the Finish Editing button and this will close the window and return the Test Results page.

Recovery Results: Within the Effect Measurements menu (Advanced Database Query) the 'Include Recovery Results' option allows you to include in your search results responses observed during a post exposure period. This is only available for aquatic test results. If you select to search on a specific effect group or effect and do not select to include the recovery results, your ECOTOX search results will only include effects observed during the direct exposure period of the study. Recovery results are indicated in the aquatic report by the placement of a tilde(~) character before the effect code (e.g., ~MOR).

If within the Quick Database Query you select an effect group, your results will include any recovery results associated with the specific query. The default in both the Advanced and Quick Database Query is to include all recovery results if no effects data are selected.

Test Conditions Searching (*Advanced Query Only*)

For each toxicity test record, pertinent information on testing procedures presented by the authors are encoded within the database. Search selections available on this page are test location, exposure media, exposures type and method of chemical analysis.

The options for searching by test conditions are briefly described below. These options are only available in the Advanced Database Query.

Test Location

The valid entries for test location are Lab (laboratory), Field (all outdoor field tests, artificial, natural or undeterminable) and Not Reported (i.e., the author(s) did not present sufficient information to determine test location). The default within ECOTOX is that all data, regardless of test location, are included in your search result. To selectively search on a specific test location, click to mark the appropriate checkbox.

Exposure Media

The default within ECOTOX is that all data, regardless of test media, are included in your search result. To selectively search on a specific exposure type, click to mark the appropriate checkbox.

Aquatic freshwater tests include those conducted in freshwater, reconstituted water, distilled water, or tap water. Saltwater tests include those conducted in natural or artificial seawater, brackish water, or estuarine water. Not Reported (NR) is used if a determination cannot be made regarding the use of either freshwater or saltwater.

Terrestrial exposure media selections are focused on tests using a substrate (e.g., soil or artificial media). If the terrestrial organism does not utilize a substrate for nutrition (e.g., birds, mammals), do not select any exposure media types.

Exposure Type

You can select the exposure type by clicking the items in the search selection box area. Organisms are typically exposed to toxicants through aqueous, diet, injection, inhalation, topical or environmental routes. Occasionally, an exposure may be through multiple routes (e.g., such as topical and oral).

ECOTOX includes chemical exposures on whole living organisms. *In vitro* assays are not included. The terrestrial plant database contains some studies using excised organs and cell cultures from plants, but these types of studies are not actively coded at this time.

Chemical Analysis

The method of chemical analysis allows you to filter out test records based on whether or not the authors reported chemical concentrations as measured or nominal values. Select the appropriate checkbox from the following options:

Measured: Exposure and/or observation concentrations or doses are quantitative; analysis methods may be reported.

Unmeasured: Exposure and/or observation concentrations or doses are clearly identified as nominal values; or when the author does not report whether the concentrations were measured or nominal, i.e., unmeasured is used as a default value when there is no information provided about the reported chemical concentrations.

Not Reported: Exposure and/or observation concentrations or doses are not reported.

Publications/Update

Publication Year(s)

The default within the ECOTOX database is that all data, regardless of publication year, are included in your search result. You may override the default publication year search by selecting a range of publication years. You should enter the bordering inclusive years of your range in the “Starting Year” and “Ending Year” boxes (e.g., 1994 through 1998).

The aquatic component of ECOTOX contains data from publication years 1915 to present; the terrestrial component of ECOTOX contains data from publication years 1926 to present.

Reference Number (*Advanced Query Only*)

You may conduct searches on specific ECOTOX reference numbers. Each publication abstracted for the ECOTOX database effort is assigned a unique reference number. These reference numbers appear in all default ECOTOX outputs. To conduct a search, enter a valid ECOTOX reference number(s) in the selection box, with one reference number per line followed by a carriage return.

Independently Compiled Data (*Advanced Query Only*)

ECOTOX includes several independently compiled data sets. Data sets from the Organization for Economic Cooperation and Development (OECD), Russia, Office of Pesticide Programs, the U.S. Geological Survey, and MED are included as subsets of the ECOTOX database. For further information on these data files, refer to Appendix F. The ECOTOX default is that all data sets are included in your search result. You may override the default and restrict your search to only data sets checked in your selection box.

Recent Modifications and Additions (*Advanced Query Only*)

You may restrict your data records to newly updated or modified data. The Recent Modifications/Additions search box allows searches based on the last nine database updates, which typically span two-three years. This feature is useful if you have a specific query (e.g., list of species and/or chemicals) that you conduct on a regular basis. The default within ECOTOX is that all data, regardless of the date they were added to ECOTOX, are included in your search result.

REPORT FORMAT

Within the Quick Database Query you can select different output formats; specifically a tabular browser viewable format, full data record, MS Excel spreadsheet, or delimited file format (use to import data into spreadsheets or databases). Under the Advanced Database Query, along with selection of different report formats, you can change the sort order of a report and add or remove data fields presented.

Report Format Options

Four output options are available; tabular report (multiple page format), MS Excel spreadsheet, Full Data Record and exporting to a delimited data file. The default format for aquatic reports is set to interactively view the output in the multiple page Tabular Output format. The default format for the terrestrial report is to view the output in the multiple page Full Data Record. By clicking on the “View Sample” icon in the upper right corner of each box listing the report format, you can see an example of what the resulting output.

Once the search has been implemented, a separate browser window will be opened for display of your search results. Each data field in the delimited file format is separated by the '|' character (usually located on the \ key). Delimited ASCII files can be saved to your hard drive and uploaded into your local spreadsheet or database software. You should close the search results window when you are finished downloading or viewing the report.

	Aquatic	Terrestrial	
Customizable Tabular Output	<input checked="" type="radio"/>	<input type="radio"/>	Browser Viewable: View Sample (5,000 record limit)
	<input type="radio"/>	<input type="radio"/>	Excel Format View Sample (5,000 record limit)
	<input type="radio"/>	<input type="radio"/>	Delimited View Sample (10,000 record limit)
Full Data Record	<input type="radio"/>	<input checked="" type="radio"/>	Browser Viewable: View Sample (500 record limit)

[Edit/View Aquatic Sort/Display](#)

[Edit/View Terrestrial Sort/Display](#)

Tabular Output (Browser Viewable)

The browser viewable table (aquatic data default) presents your search results on a multi-page format that may then be viewed, printed or saved to a file using the File menu option on your browser. Once ECOTOX has generated a report, the first page of your output always displays below the report header information. At the top of each report is contact information for the ECOTOX support staff, date of the search, number of records in the report, and the number of separate browser window pages. The last page of the report will be citations for the references associated with the data records.

The browser viewable report has set default output fields. Appendix G provides an example default Browser Viewable tabular output for aquatic data. You may modify the output fields in the Advanced Database Query (see below).

If the author did not report data for a database field, the browser report will display a blank field. Definitions for all codes presented in the report can be found in the ECOTOX Code List located on the "Starting Out" section of the Help Center.

Navigating within the Report: You can move through the report in a number of ways. To view within a page, use the scroll bar on the right side of the window. String searches may also be performed by clicking the Web browser software Edit menu on the top browser window Tool bar and using the Find In Page option. To move from one page to another page of the report, use the numbered hyperlinks located at the top or bottom of each report page.

You can view the full data record by clicking on the View Details hotlink located in each table row. This provides all data fields coded in the ECOTOX database for the particular data record, including any comment fields. For descriptions of abbreviations that appear in the comment field see Appendix H.

Printing and Saving a Report: To print a report, select the browser File menu and select the Print option. To save the report as a file, use this same File menu and choose the Save As option. It should be noted that each page identified in the browser window may actually contain several printable pages (e.g., page 1 when printed may result in 18 printed pages). Additionally, you must click each page identified in the browser window in order to view, print or save all downloaded records.

The ECOTOX software cannot control your web browser print function and field width. Successfully printing output is dependent upon your web browser preferences and/or your printer capabilities. These options can help to fit your report on a printout:

- Reduce your web browser font size.
- If your report width is wider than a portrait page size, you can modify your web browser print option to a landscape orientation

- Some web browsers have a Print Preview option for use in viewing the actual look of the output.
- You may want to consider using the delimited file option, then merging/adjusting the columns or selecting fewer output fields.
- If you are using Internet Explorer, choose *View->Fonts->Smallest* from the menus and then print in landscape mode. This will work for very wide reports. Note that Netscape allows you to reduce the font size as well, but when it prints it reverts to the original font size and truncates the right side of the report.
- Some printers have advanced settings available from the print window that allow you to "scale" the print image. If this feature is available, try different values to determine which one works best for your reports.
- Save the browser report as a ".htm" file and open it with a word processing application where the font size can be reduced and column sizes adjusted.

Microsoft (MS) Excel

The option allows you to save or view your report in an MS Excel format. The tabular output is similar to the browser viewable table. However, each field will be separated into unique columns presented in a single row.

When you retrieve the results of your search in a delimited format a message box will appear on your screen. If you already have an MS Excel Plugin installed, the report should automatically load. If you do not have an Excel Plugin or want to save the file, select 'Save file.' A 'Save As' window will appear. Select the appropriate directory on your hard drive and type in your desired filename.

The first row of the MS Excel spreadsheet presents coded versions of the data field identifier. Appendix I provides a key to the fields identifiers. For MS Excel reports, the Reference Citation field will appear in the separate delimited fields (Author, Title, Publication Year and Source).

The MS Excel spreadsheet format has set default output fields. To see an example of the MS Excel format click on the View Sample button associated with the MS Excel output in the Report Format box. You may modify the output fields in the Advanced Database Query (see below).

If the author did not report data for a particular parameter, the MS Excel spreadsheet will have an NR (not reported) in the data field. Definitions for all codes presented in the report can be found in the ECOTOX Code List located on the "Starting Out" section of the Help Center.

Delimited Output

This option allows you to generate an ASCII delimited data file of your search results. The exported data file may be imported into spreadsheet or database software for use

on your personal computer system. Each data element is separated into a unique field, and each test record appears on a single line. For delimited reports, the Reference Citation field will appear in the separate delimited fields (Author, Title, Publication Year and Source).

When you retrieve the results of your search in a delimited format a message box will appear on your screen. Select 'Save file.' A 'save as' window will appear. Select the appropriate directory on your hard drive. You may change the file name at this time.

Each field in the delimited file report will be separated by a vertical bar ("|"). Using the vertical bar as a delimiter between fields is typically not the default method supported by applications that import data (e.g., spreadsheets) and hence you may have to specify the vertical bar as the delimiter when you import the data. The vertical bar key is usually located on the same key as the "\" (backslash) character on most keyboards, and may appear as two shorter vertical lines with a gap between them.

To import a delimited file into a Microsoft Excel spreadsheet, you should do the following:

1. Start the Spreadsheet
2. Go to the menu choice File->Open
3. Change the file types to "All file types (*.*)"
4. Select the file
5. Choose a delimited file format
6. Choose a vertical bar (|) as the field delimiter
7. Click Finish

Your file should now be imported into a spreadsheet for your analysis. A forward slash (/) within a field refers to an associated comment. You can select comment fields in your output to help interpret unique test conditions. For a complete understanding of the toxicity study, you will need to obtain the full publication.

The first row of the delimited output presents coded versions of the data field identifier. Appendix I provides a key to the fields identifiers.

The delimited tabular output format has set default output fields. To see an example of the delimited output format click on the View Sample button associated with the output in the Report Format box. You may modify the output fields in the Advanced Database Query (see below).

If the author did not report data for a particular parameter, the delimited output will have an NR (not reported) in the data field. Definitions for all codes presented in the report can be found in the ECOTOX Code List located on the "Starting Out" section of the Help Center.

Full Data Record

The browser viewable Full Data Record (terrestrial data default) presents your search results on a multi-page format that may then be viewed, printed or saved to a file using the File menu option on your browser. At the top of each report is contact information for the ECOTOX support staff, date of the search, number of records in the report, and the number of separate browser window pages. Once ECOTOX has generated a report, the first page of your output always displays below this information. The last page of the report will be citations for the references associated with the data records.

You can also view the full record format by clicking on the View Details hotlink located in each table row to see an example of each format before selecting. This provides all data fields coded in the ECOTOX database for the particular data record, including any comment fields. For descriptions of abbreviations that appear in the comment field see Appendix H.

Full record display fields cannot be modified. The sort order may not be modified using the Advanced Database Query (see below).

Sort Order (*Advanced Query Only*)

The data are sorted within the aquatic and terrestrial reports in a predefined way. For the aquatic and terrestrial outputs, the default sort order is Chemical (CAS#), Species Group, and Reference Number.

You can change the sort order by selecting the report format you want and clicking on the View /Edit Aquatic or Terrestrial Options on the Report Format page. Remember, the Sort Order does not change the data, it just changes the order in which the data appear in the report. Use the three sort order drop-down lists to select alternate sort order for Aquatic or Terrestrial output. When you have completed your selections, press the Finished Editing button at the bottom of the Output Selection box.

If you require a more specific sort option, download your search in a delimited file format and transfer the file into a spreadsheet or database on your computer and use your software to sort the data.

Display Fields

Default Select data parameters are presented in the default versions of the aquatic and terrestrial tabular reports (i.e., Browser Viewable, MS Excel, and Delimited). You can change the display fields for tabular, MS Excel, and delimited outputs by selecting the report format you want and clicking on the View /Edit Aquatic or Terrestrial Options on the Report Format web page. Full Data Record outputs cannot be modified.

Within the Aquatic or Terrestrial Output Selection box web page, the complete list of data fields coded within the ECOTOX database are displayed. A checkmark appears in data fields that are displayed in the default output format. See Appendix G for a sample of the default reports. To remove a selected data field, click on the checked box. To add a data field, click on the checkbox and add a checkmark. The report width displayed in browser viewable tabular reports is defined by the data fields and the Web browser settings selected, so carefully modify the output fields to fit within your preferences.

Some display files are comments with header codes followed by a slash (/) (e.g., Exp Type/). The definitions for these comment header codes and descriptions are found in Appendix H.

PERFORM QUERY

Review Query (*Advanced Query Only*)

Before conducting a search using your search criteria, you may want to review your search strategy. Click on the Review Query under the Key Function area at the top of the Advanced Database Query page. For documentation purposes, you may want to print the Review Query information and attach it to the reports that are generated using the search criteria.

Restore Defaults

This Restore Defaults button will clear the search criteria and restore the report format to its original default selections.

Perform Query on Aquatic Data / Perform Query on Terrestrial Data

Click the "Perform Query on Aquatic Data" or "Perform Query on Terrestrial Data" button when you are ready to initiate your search strategy and create a report/output. While the system is performing the database search, a separate window is created indicating that an ECOTOX database search is generating. When the search is complete, the appropriate results (report contents or data file name) for aquatic or terrestrial report(s) will appear in this window. Information about how to retrieve your output will display:

- Once the search results are available for a browser viewable report, the output will display in the bottom section of this page.
- Once the search results are available for the MS Excel or delimited outputs, a new window will open up allowing you to save or open your file in the appropriate software.
- For Browser Viewable reports, you may need to scroll down to view the entire page. Also, the report will span more than one page; click on the 'Next' or page number buttons to move through the output.
- Close the search results window before conducting a new search.

- If the number of retrieved records is too large, a report will not be presented.
 - There is a maximum number of 500 data records that can be viewed in the Full Data Records output.
 - For aquatic outputs in the Browser Viewable or MS Excel formats, 5,000 data records can be retrieved in each search.
 - For the Delimited Tabular Outputs, 10,000 records can be retrieved in each search.

If the number of records is larger than you would like to view, you may close the report window and return to the ECOTOX Database window to refine your search strategy.

Once you have completed your search, and closed the report window, you will be returned to the ECOTOX database window. The search strategy will remain intact, so you may go back and refine your search if you wish. If you want to conduct another search, you may clear the search by clicking the 'Restore Defaults' button in the Key Function area at the top of the search window.

EXITING ECOTOX

Exiting your Web browser or visiting another Web site will leave the program. Exiting the Web browser will not save your search strategy.

APPENDIX A: ECOTOX SEARCH PLANNING FORM

Use this form to help plan your searches or to document searches for yourself or others to perform.

Species

Scientific Names/ Taxonomic Levels	Common Names	Species Numbers	Predefined Taxonomic Groups
			<input type="checkbox"/> All Animals <input type="checkbox"/> Amphibians <input type="checkbox"/> Insects/Spiders <input type="checkbox"/> Molluscs <input type="checkbox"/> Birds <input type="checkbox"/> Other Invertebrates <input type="checkbox"/> Reptiles <input type="checkbox"/> Crustaceans <input type="checkbox"/> Mammals <input type="checkbox"/> Worms <input type="checkbox"/> Fish <input type="checkbox"/> All Plants <input type="checkbox"/> Algae, Moss, Fungi <input type="checkbox"/> Flowers, Trees, Shrubs, Ferns Special Interest <input type="checkbox"/> Standard Test Species <input type="checkbox"/> U.S. Threatened and Endangered Species <input type="checkbox"/> U.S. Exotic/Nuisance

Chemicals

Chemical Names	CAS Numbers	Predefined Groups
		Metal Compounds <input type="checkbox"/> Aluminum <input type="checkbox"/> Antimony <input type="checkbox"/> Barium <input type="checkbox"/> Beryllium <input type="checkbox"/> Cadmium <input type="checkbox"/> Cobalt <input type="checkbox"/> Copper <input type="checkbox"/> Organotin <input type="checkbox"/> Iron <input type="checkbox"/> Lead <input type="checkbox"/> Manganese <input type="checkbox"/> Nickel <input type="checkbox"/> Selenium <input type="checkbox"/> Silver <input type="checkbox"/> Vanadium <input type="checkbox"/> Zinc Organic Compounds <input type="checkbox"/> DDT and metabolites <input type="checkbox"/> Dibenzofurans <input type="checkbox"/> Glycol Ethers <input type="checkbox"/> Nitrosamines <input type="checkbox"/> Phthalate Esters <input type="checkbox"/> Polyaromatic Hydrocarbons (PAHs) <input type="checkbox"/> Polychlorinated Biphenyls (PCBs)

Test Results

Endpoints: _____

Effect Groups:

<input type="checkbox"/> Accumulation	<input type="checkbox"/> Mortality
<input type="checkbox"/> Behavior	<input type="checkbox"/> Physiology
<input type="checkbox"/> Biochemical	<input type="checkbox"/> Population
<input type="checkbox"/> Cellular	<input type="checkbox"/> Reproduction
<input type="checkbox"/> Growth	<input type="checkbox"/> Ecosystem

☐ Specific Effect Measurements _____

☐ Include Recovery Results (for aquatic data)

Test Conditions

Test Location(s):

<input type="checkbox"/> Lab	<input type="checkbox"/> All Field Tests
	<input type="checkbox"/> Field Artificial
	<input type="checkbox"/> Field Natural
	<input type="checkbox"/> Field Undeterminable

Exposure Media:

WATER: ☐ Freshwater ☐ Saltwater ☐ Unknown

SOIL: ☐ Artificial ☐ Humus ☐ Litter ☐ Manure ☐ Mineral Soil ☐ Mixture ☐ Natural Soil

☐ Unspecified Soil

ARTIFICIAL: ☐ Hydroponic ☐ Other ☐ No Substrate

Exposure Type:

<input type="checkbox"/> Diet	<input type="checkbox"/> Flow-through (aquatic)
<input type="checkbox"/> Injection	<input type="checkbox"/> Leaching (aquatic)
<input type="checkbox"/> Topical	<input type="checkbox"/> Intermittent (aquatic)
<input type="checkbox"/> Environmental (terrestrial)	<input type="checkbox"/> Renewal (aquatic)
<input type="checkbox"/> Inhalation (terrestrial)	<input type="checkbox"/> Static (aquatic)
<input type="checkbox"/> Multiple Entry (terrestrial)	<input type="checkbox"/> Tidal (outdoor aquatic)
	<input type="checkbox"/> Lentic (outdoor aquatic)
	<input type="checkbox"/> Lotic (outdoor aquatic)

Chemical Analysis: ☐ Measured ☐ Unmeasured ☐ Not Reported

Publications

Publication Years: _____

Reference Number(s): _____

Update Dates: _____

Report Format

- ☐ Browser Viewable Tabular Report - Multiple viewable pages
☐ Browser Viewable Full Record
☐ MS Excel
☐ Delimited Report - used for importing into other software applications (e.g. Excel, Lotus etc.)

Sort Fields: 1) _____ 2) _____ 3) _____

Field Output Selections: Standard default output elements are listed in bold. Some aquatic output options are available for Field Data only, and are indicated by (Field Data Only). Modifications to report options are only available in the Advanced Database Query.

Aquatic Output Elements (default report items are in bold)	Terrestrial Output Elements (default for browser viewable or delimited are in bold) (modify for delimited output only)
<input type="checkbox"/> Test Location <input type="checkbox"/> CAS Number/Chemical Name <input type="checkbox"/> Scientific Name/Common Name <input type="checkbox"/> Endpoint <input type="checkbox"/> Effect <input type="checkbox"/> Trend <input type="checkbox"/> Exposure Type <input type="checkbox"/> Exposure Duration <input type="checkbox"/> Media Type <input type="checkbox"/> Concentration Type <input type="checkbox"/> Concentration/Application Rate (Field Data only) <input type="checkbox"/> Application Type (Field Data Only) <input type="checkbox"/> Application Frequency (Field Data Only) <input type="checkbox"/> Application Season/Date (Field Data Only) <input type="checkbox"/> Significance/ Level <input type="checkbox"/> Response Site <input type="checkbox"/> Reference Number <input type="checkbox"/> Application Rate (Field Data Only) <input type="checkbox"/> Alkalinity <input type="checkbox"/> BCF Value <input type="checkbox"/> Chemical Analysis Method <input type="checkbox"/> Chemical Comments <input type="checkbox"/> Comments <input type="checkbox"/> Control Type <input type="checkbox"/> Documentation Code <input type="checkbox"/> Effect % <input type="checkbox"/> EE Comment <input type="checkbox"/> Experimental Design <input type="checkbox"/> GEO Code (Field Data Only) <input type="checkbox"/> Geographic Location (Field Data Only) <input type="checkbox"/> Habitat Code <input type="checkbox"/> Habitat Description (Field Data Only) <input type="checkbox"/> Hardness <input type="checkbox"/> Ionic Fraction <input type="checkbox"/> Test Number <input type="checkbox"/> Longitude/Latitude (Field Data Only) <input type="checkbox"/> Organic Carbon <input type="checkbox"/> Organic Carbon Type <input type="checkbox"/> Organism Comment	<input type="checkbox"/> Application Frequency <input type="checkbox"/> Basis of measurement (wet/dry) <input type="checkbox"/> CAS Number <input type="checkbox"/> Chemical Analysis Method <input type="checkbox"/> Chemical Name <input type="checkbox"/> Chemical Comment <input type="checkbox"/> Chemical Formulation <input type="checkbox"/> Chemical Grade <input type="checkbox"/> Chemical Purity <input type="checkbox"/> Concentration/Dose <input type="checkbox"/> Control Type <input type="checkbox"/> Documentation Code <input type="checkbox"/> Dose Number <input type="checkbox"/> Dose Statistical Method <input type="checkbox"/> Effect <input type="checkbox"/> Effect Measurement <input type="checkbox"/> Endpoint <input type="checkbox"/> Exposure Dose <input type="checkbox"/> Exposure Duration <input type="checkbox"/> Exposure Number <input type="checkbox"/> Exposure Comment <input type="checkbox"/> Exposure Type <input type="checkbox"/> Gender <input type="checkbox"/> Ionic Fraction <input type="checkbox"/> Lifestage <input type="checkbox"/> Media Type <input type="checkbox"/> Observation Duration <input type="checkbox"/> Observed Response <input type="checkbox"/> Organism Age <input type="checkbox"/> Organism Comment <input type="checkbox"/> Organism Source <input type="checkbox"/> Publication Year <input type="checkbox"/> Reference Citation <input type="checkbox"/> Reference Number <input type="checkbox"/> Response Site <input type="checkbox"/> Result Comment <input type="checkbox"/> Result Percent Lipid <input type="checkbox"/> Result Percent Dry/Wet Weight <input type="checkbox"/> Result Record Number

<input type="checkbox"/> pH <input type="checkbox"/> Publication Year <input type="checkbox"/> Reference Citation <input type="checkbox"/> Salinity <input type="checkbox"/> Species Number <input type="checkbox"/> Study Type <input type="checkbox"/> Substrate Code (Field Data Only) <input type="checkbox"/> Temperature	<input type="checkbox"/> Result Statistical Method <input type="checkbox"/> Reviewer Assigned Endpoint <input type="checkbox"/> Sample Number <input type="checkbox"/> Significance/ Level <input type="checkbox"/> Soil Cation Exchange Capacity <input type="checkbox"/> Soil Concentration Measured <input type="checkbox"/> Soil Moisture <input type="checkbox"/> Soil Organic Matter <input type="checkbox"/> Soil pH <input type="checkbox"/> Soil Clay % <input type="checkbox"/> Soil Sand % <input type="checkbox"/> Soil Silt % <input type="checkbox"/> Species Common Name <input type="checkbox"/> Species Scientific Name <input type="checkbox"/> Species Number <input type="checkbox"/> Study Duration <input type="checkbox"/> Test Comment <input type="checkbox"/> Test Location <input type="checkbox"/> Test Number
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APPENDIX B: PRACTICE SEARCHES

These examples are for you to try in the Advanced Database Query pages. After each example search, remember to click on “Restore Defaults ” before proceeding to the next search.

Example A

You want to locate all reproductive effects data for nickel compounds. What types of reproductive effects were measured?

1. Click on Chemicals from the menu. Scroll down to Predefined Chemical Lists. Select **Nickel** from the metal compound list,
2. Click on “Test Results” from the menu. Scroll to the Effects list. Click on Group Effect **REPRODUCTION**. This will display and select all the reproductive effects within ECOTOX.
3. For Aquatic data, click on menu item Report Format. Select **EE COMMENT** from the Aquatic Report Format, for the tabular report. The Terrestrial default full data will display the specific measurement in the report.
4. Click on “**Perform Query for Aquatic Data**” button for aquatic data. Click on “**Perform Query for Terrestrial Data**” button for terrestrial data.

Example B

You want to locate LC50 data on freshwater organisms exposed to malathion.

1. Click Chemical menu. Type in CAS Number: **121755** or **Malathion** in the Chemical Entry selection box.
3. Click Test Results menu. In the Endpoint menu, select **LC50/LD50** checkbox.
4. Click Test Conditions menu. Scroll down to the Exposure Media page and click on **FRESHWATER** checkbox.
5. Click on “**Perform Query for Aquatic Data**” button.

Example C

You want to locate recently published, lethality endpoint only studies on Daphnia magna.

1. Click Taxonomic menu. Type in **DAPHNIA MAGNA** and select the Genus/Species Name category.
3. Click on Test Results hotlink from the menu. In the Endpoint entry area, select all the Concentration and Time based endpoint check boxes.
4. Scroll down to the Effects selection area and click on the **MORTALITY** Effect Group checkbox.

5. Click on Publications/Updates menu. In the Publication selection box area, select **2000** in the first drop down list and select **2004** in the second drop down list from the items.
6. Click on “**Perform Query for Aquatic Data**” button.

Example D

You want to locate toxicity data for amphibian tests performed in an outdoor location. You would like to move these data records into your own database.

1. Click on the Species menu. In the Predefined Taxonomic Group, check the **Amphibians** box.
2. Click on the Test Conditions menu. In the Test Location area, select the checkbox **ALL FIELD TESTS** from the list.
3. Click Report Format menu. Click on the **DELIMITED REPORT** option for both aquatic and terrestrial. Note: If you only want larval aquatic lifestage, specify the aquatic habitat; adult terrestrial lifestage specify the terrestrial lifestage.
4. Click on “**Perform Query for Aquatic Data**” then “**Perform Query for Terrestrial Data**” buttons.

Example E

You want to use terrestrial Standard Species and locate data that are in the EPA Office of Pesticide Products Database.

1. Click on Publications/Update menu. Select the **EPA Office of Pesticide Products Dataset** checkbox within the Independently Compiled Data selection box area.
2. Click on Taxonomic menu. Scroll down to Predefined Taxonomic Group. Select **Standard Species**.
3. Click on “**Perform Query for Terrestrial Data**” button.

APPENDIX C: ECOTOX DATABASE OVERVIEW

Data Sources

The primary source of toxicity effect information in ECOTOX is the peer reviewed literature. Pertinent literature is identified through online computerized searches of the international literature. The computerized searches were initiated with the 1970 publication year and continue through to the present. Comprehensive searches are designed to include the effect of nearly all toxic substances on aquatic and terrestrial organisms within the scope of each ECOTOX database systems' guidelines. Commercial literature sources are continually evaluated for relevance to the ECOTOX literature searches. The search strategy is evaluated regarding the success ratio of each search. Additional literature sources include abstract journals, review bibliographies, and the EPA MED library collection.

The abstracts obtained through computerized searches of abstracting databases are screened to identify toxicity references applicable to aquatic and terrestrial habitats. Those references pertinent to one or more of the databases are acquired through a variety of literature acquisition procedures such as author reprint requests, inter-library loans, and commercial sources. As the publications are received, a reference number is assigned for storage and retrieval purposes, and a final check for applicability and duplication is made. A bibliographic sub-file stores the citations and a reprint of each publication is archived.

Publications used in ECOTOX usually contain unique data. Toxicity test data are included unless the data have been cited as published elsewhere. Data reported in review papers are abstracted from the original publication. International publications may be reviewed by ECOTOX staff if either an English abstract or a translated table of data is included. International cooperative efforts with the Organization for Economic Cooperation and Development (OECD) and Russia (Borok Institute) have been used to enhance review of the international literature.

Data obtained from independently compiled data files must meet the minimum data requirements and quality assurance guidelines defined for each ECOTOX database component. The key data fields that must be included are: test chemical name, test organism, test duration, effect, and effect concentration or application rate. Table 1 outlines the minimum data requirements for each ECOTOX database.

Table 1: ECOTOX Minimum Data Requirements

Requirement	AQUIRE	PHYTOTOX	TERRETOX
Chemical	Single chemicals relevant to environmental exposure	Single chemicals relevant to environmental exposure	Single chemicals and oils relevant to environmental exposure.
Species	Exclusively aquatic plants and animals	Terrestrial plants	Air-breathing animals (e.g., includes ducks, whales)
Effect	Biological effect on live organisms	Biological effect on live organisms	Biological effect on live organisms
Concentration or Dose Value	Must have concurrent environmental chemical concentration/dose	Must have concurrent environmental chemical concentration/dose	Must have concurrent environmental chemical concentration/dose
Exposure Duration	Duration required, except for abstracts	Duration required	Duration required
Concentration or Dose/Response	Endpoints hierarchically coded. Non-statistically analyzed and qualitative data may be summarized by effect into one test.	Since February, 2000, all endpoints and individual quantitative dose - response data.	All endpoints and individual quantitative dose - responses data.

Documentation describing the test methods must be provided within the publication. If tests are missing key parameters, the data are rejected. No effort is made to locate unreported data (e.g., authors are not contacted, citations referring to methods used are not obtained). During the incorporation of an electronic data file, a quality assurance check of the CAS number, species scientific name, and reference citation is completed. Data files that have been included in the aquatic dataset are the [MED fathead minnow acute toxicity database](#) (Center for Lake Superior Studies; University of Wisconsin-Superior, 1984, 1985, 1986, 1988, and 1990), and data sets from France, Germany, the Netherlands and Russia. ECOTOX also includes the U.S. EPA OPP's Pesticide Ecotoxicity Database for both aquatic and terrestrial toxicity tests. Appendix F contains additional information and contacts for independently compiled data files.

Quality Assurance

Quality assurance procedures begin with literature acquisition and cataloging, and continue through the chemical and species verification, the literature review process, data entry, and data retrieval. The ECOTOX literature is encoded by trained document abstractors. An intensive training period, a well-documented manual (U.S. EPA 2003), and close interaction with the data coordinator help to ensure a high level of accuracy and consistency in the reviewing process. Ten percent of the publications are independently reviewed by two different reviewers. These reviews are compared, differences (if any) are documented, discussed, and resolved by the data coordinator.

Aquatic Data Elements

Aquatic data includes toxic effect results from exposures of single chemicals to aquatic organisms. Bioassays not included are water chemistry effects (e.g., pH), complex effluents, sediment studies that do not report a water concentration and chemical mixtures. If a publication contains data for a single chemical besides one of the above categories of toxicants, the paper is retained and only the single chemical data are used in ECOTOX. Test organisms are limited to those that are exclusively aquatic.

Amphibian and insect data for purely aquatic life stages of the organism are included. Information and data for terrestrial life stages of these organisms is included in the terrestrial database. Classes of organisms associated with the aquatic environment (e.g., birds, mammals, reptiles) are coded in the terrestrial database. Microbial communities (bacteria and virus) are omitted from the aquatic database. Terrestrial plants tested in hydroponic or nutrient solutions are coded in the terrestrial database.

The data elements for each test are grouped by chemical, organism, exposure conditions, and effect endpoint. The test chemical parameters describe the toxicant, the associated CAS registry number, and the grade, purity and/or composition of the toxicant. The test organism parameters define the type of organism and the lifestage being tested. The test conditions identify the test water, test location, exposure type and duration, control parameters, and basic water chemistry. The effect endpoint parameters consist of a code to define the lethal, sublethal, or residue endpoint and the corresponding test chemical concentration.

Aquatic Effect Parameters

A separate line is coded for each effect or endpoint from either a unique experimental design or within one design scenario for statistically defined effects or endpoints. If no statistics are used to distinguish endpoints or effects and experimental designs are similar the data may be combined into one data record. Endpoints always require a discrete line. Effects lacking an author reported endpoint may be combined based on statistical representation by the author. Food chain effects are coded for organisms at the first level of exposure.

Toxicity test results are primarily reported for observations taken during the chemical exposure. However, when results are reported only for the period of time after the exposure, i.e. recovery or delayed effects, this type of result is noted by using a "~" in conjunction with the endpoint/effect code, e.g., ~MOR for a delayed mortality effect.

Terrestrial Data Elements

Toxicity data includes toxic effect results from exposures of single chemicals to terrestrial organisms. The terrestrial toxicity database includes individual dose response values, if reported. Only quantitative data are encoded from the publication, qualitative data are

excluded. Graphical data may be coded as ranges and is reported by using <, > or ~ operators with the value.

Bioassays not included are contaminated soils, sediment studies and chemical mixtures. If a publication contains data for a single chemical besides one of the above categories of toxicants, the paper is retained and only the single chemical data are used in ECOTOX. Test organisms are limited to those that are exclusively terrestrial.

The data elements for each test are grouped by chemical, organism, exposure conditions, and effect endpoint. The test chemical parameters describe the toxicant, the associated CAS registry number, and the grade, purity and/or composition of the toxicant. The test organism parameters define the type of organism, organism source and the lifestage being tested. The test conditions identify the test location, exposure type and duration, control parameters, and basic soil parameters. The effect endpoint parameters consist of a code to define the lethal, sublethal, or residue endpoint and the corresponding test chemical concentration.

If the author does not report data for a terrestrial database field, the field will display a "NR" (not reported).

The terrestrial data identifies sources of alternative data (domestic, laboratory animal or plant toxicity and bioaccumulation information) when there is a paucity of information on wildlife species. Animals associated with the aquatic environment that breathe using lungs (e.g., ducks, whales) are included in the terrestrial database. Exposures to the aquatic life stages of amphibians and insects are included in the aquatic database.

Decisions regarding the inclusion of animal terrestrial species are based on published terrestrial wildlife toxicity standard methods and procedures documentation. The priority for the animal portion of the database is wildlife avian species, e.g. mallard, pheasant or bobwhite; mammalian species, e.g., meadow vole, deer mouse or mink; and beneficial invertebrate species, e.g., earthworm, honey bee, leafcutter bee or alkali bee. If data for other species including laboratory, domestic or non-beneficial organisms are reported in a publication, data for all test species are coded for ECOTOX

Terrestrial plant data includes native, crop, or weed species. Terrestrial plants tested in hydroponic or nutrient solutions are coded in the terrestrial database. Aquatic plant exposures are recorded in the aquatic database.

Test Identification

Test identification number is used to designate each unique test design. A unique test design may be characterized by a new test chemical, test species, test location, or exposure type. Additionally, there are experimental design parameters that will influence a test scenario sufficiently to warrant an independent test record. Such parameters

include tests conducted at different test temperatures or conducted during different seasons.

References

Center for Lake Superior Environmental Studies, University of Wisconsin-Superior; 1984, 1985, 1986, 1988, and 1990. *Acute Toxicities of Organic Chemicals to Fathead Minnows (Pimephales promelas)*, Vol. 1-5. University of Wisconsin-Superior, Superior, WI.

U.S. Environmental Protection Agency. 2004. *MED Ecotoxicology Database Standard Operating Procedures* (prepared by Computer Sciences Corporation, Contract 68-W-02-032, Task 2024), Mid-Continent Ecology Division, Duluth, MN.

APPENDIX D: SPECIES AND CHEMICAL VERIFICATION

Species Verification

The test organism is identified by the current scientific name as verified in the taxonomic literature. For each species entry, the verified name, taxonomic kingdom, nomenclature history, and verification sources are kept on file for documentation purposes. A species number can be located using the species scientific name or common name. ECOTOX retains all species name synonyms that are no longer used for taxonomic classification. These synonyms are identified within the scientific name file by a trailing 'Historical name' after the scientific name. You are able to search in ECOTOX using the species synonym name, however, your output will contain the currently accepted species name. Taxonomic kingdoms are divided into plant (including fungi and monera) and animal.

Field studies may report results for a target community (e.g. benthic macroinvertebrates) or for an entire enclosed ecosystem (e.g. system-level primary productivity or respiration). If a community of organisms was tested, the species grouping from the publication is reported.

Taxonomic Hierarchy

You can search on various taxonomic levels. Within the Browse Species index, you can view the taxonomic levels for each species:

- Kingdom
 - Phylum
 - Division
 - Subphylum
 - Superclass
 - Class
 - Order
 - Family
 - Genus
 - Species
 - Subspecies
 - Variety

The taxonomic levels are verified by the ITIS (Integrated Taxonomic Information System, located at: [http:// www.itis.usda.gov/](http://www.itis.usda.gov/)). If the taxonomic levels are not available with ITIS, other taxonomic sources are used.

Predefined Special Interest Sources

The species of special interest groups were compiled using the following references:

| Standard Test Species References |
|---|
| <ol style="list-style-type: none"> 1) EPA, Office of Solid Waste and Emergency Response, Publication 9345.0-051 (ECO Update Volume 2, No. 2) 2) BC Research, Inc. 3) ASTM 4) OECD Test Guidelines 5) EPA, Office of Prevention, Pesticides and Toxic Substances, Harmonized Test Guidelines, Series 850, Ecological Effects Test Guidelines |
| U.S. Threatened and Endangered Species Reference |
| <p>U.S. Fish and Wildlife Service (http://endangered.fws.gov/wildlife.html#Species) Updated annually.</p> |
| U.S. Exotic/Nuisance Species References |
| <ol style="list-style-type: none"> 1) ANS Task Force. (2003) Dedicated to the prevention and control of nuisance aquatic species. http://www.anstaskforce.gov/index.htm# 2) Aquatic Invasive Species and the Great Lakes: GLERL's Program and Action Plan. http://www.glerl.noaa.gov/pubs/brochures/invasive/invasive.pdf 3) Chesapeake Bay Program Office (2003). Invasive Species Workshop. http://www.chesapeakebay.net/search/ongoingproj.cfm?GROUP_INIT=NISW&GROUP_AFFIL=Living 4) Exotic Species of the Monterey Bay National Marine Sanctuary. http://bonita.mbnms.nos.noaa.gov/sitechar/spex.html 5) Exotic Species Program. 2003. Harmful Exotic Species of Aquatic Plants and Wild Animals in Minnesota: Annual Report for 2002. Minnesota Department of Natural Resources, St. Paul, MN. 6) Flack, Stephanie & Elaine Furlow (1996). America's Least Wanted, A lineup of the country's twelve meanest environmental scoundrels. Nature Conservancy - November/December pp. 17-23. 7) Great Lakes Panel on Aquatic Nuisance Species. (Aug.1998) Biological Invasions, How aquatic nuisance species are entering North American waters, the harm they cause and what can be done to solve the problem. 8) Hellquist, C. Barre. (1997). A Guide to Invasive Non-native Aquatic Plants in Massachusetts. Massachusetts Department of Environmental Management, Lakes and Ponds Program. 9) Illinois Dept of Natural Resources & Natural Areas Techniques Forum. NAA Chinese Yam Task Force, jshimp@dnrmail.state.il.us 10) Invasivespecies.gov (2003) A gateway to Federal and State invasive species activities and programs. http://www.invasivespecies.gov/profiles/main.shtml 11) Minnesota Dept of Natural Resources (Jan. 2000). On the Water Front, The Exotic Species Update. 12) Minnesota Sea Grant, Exotic Species Program. http://www.seagrants.umn.edu/exotics/fishhook.html 13) Mortensen, Carol Estes. Is it a wildflower, or is it a weed? Minnesota National Forests, Leech Lake Reservation Division of Resources Management. 14) National Biological Information Infrastructure (2003). Invasive Species Information Node. http://invasivespecies.nbii.gov/downloads/SppListMaster18jun02.xls 15) Rendall, Jay. (1999) Weeds Gone Wild. Minnesota Conservation Volunteer, July-Aug 1999 16) Stratford, Kay & Barbara Doll. Invasive Aquatic and Wetland Plants. Field Guide. North Carolina Sea Grant. 17) The Great Lakes Schoolship, Inland Seas Education Association, Invasive Species Education |

Program. http://www.schoolship.org/invasivespecies/docs2/K_Invasive_Species_Table.pdf
18) The Nature Conservancy (1996). America's Least Wanted: Alien Species Invasions of U.S. Ecosystems.
19) USDA, NRCS. 2002. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
20) "USGS, Nonindigenous Aquatic Plant Maps and Species Accounts http://nas.er.usgs.gov/plants/sp_accnts.html"
21) USGS: Nonindigenous Aquatic Species. <http://nas.er.usgs.gov/>
22) USGS: Nonindigenous Mollusk Distribution Information . <http://nas.er.usgs.gov/>
23) Western Regional Panel on Aquatic Nuisance Species, (Sept 2001). The invasion of western waters by non-native species, Threats to the West.
24) Wisconsin Department of Natural Resources (2003). Non-native Plants. <http://www.dnr.state.wi.us/org/land/er/invasive/nonnative.htm>

Chemical Verification

A standardized identification number and name for each chemical recorded in the database is used for consistency. Chemicals reported in the ECOTOX database are cataloged by using a Chemical Abstracts Service (CAS) registry number. If a CAS registry number is not available for the test chemical, toxicity data cannot be included in ECOTOX. Toxicants not included in ECOTOX are water chemistry effects (e.g., pH), complex effluents and chemical mixtures. If the author states that a soil nutrient is added to maintain test organism growth, the test is included. If the test includes a series of nutrient doses and a toxicant to produce interactive effects, this is considered a mixture and excluded.

Retrieval is made by using the CAS number, chemical name or chemical list. The Collective Index (CI) name is used as the standardized name for storage and retrieval. A separate index file is available for screening CAS numbers and chemical names used in ECOTOX. It is important to stress that you refer to the original publication to obtain additional test chemical information which may affect the context of toxicity information retrieved from ECOTOX.

APPENDIX E: ECOTOX DATA FIELD DESCRIPTIONS

All associated codes for these field are located in the ECOTOX Code List. Data fields are listed for both aquatic and terrestrial. If the field is only available for one database, this is noted (Aquatic only or Terrestrial only).

Chemical Fields

Chemical Carrier - Solvent used to dissolve toxicant in solution or positive control.

CAS Number - Chemical Abstracts Service (CAS) Number

Chemical Name - CAS Collective Index Name

Chemical Grade - Grade of chemical

Chemical Purity - Percent purity or active ingredient

Chemical Formulation - Formulation of chemical

Chemical Comment - Chemical formulation code, trade names, synonyms, isomers

Chemical Radiolabel (Aquatic Only) - The isotope of a test or carrier chemical.

Species Fields

Species Number - Unique number assigned by ECOTOX software.

Species Scientific Name - Currently accepted scientific name (genus,species)

Species Common Name - Species or taxonomic grouping common name(s)

Organism Source (Terrestrial only) -The type of source the test organism was obtained

Organism Lifestage - Initial test organism lifestage

Organism Age - Initial age of the test organism

Organism Comment - Initial age, weight, length, developmental stage or cell concentration of test organism.

Species Group -

Taxonomic Information - Organism classification hierarchy (Kingdom, Phylum/Division, Class, Order, Family, Genus, Species).

Kingdom - Divides all species into two kingdoms (plant or animal). The plant kingdom includes Monera and Fungi species. A taxonomic group (e.g., aquatic community, plankton) that has both plant and animal kingdoms into one result are included in both plant and animal kingdom search. (Search option only. Not an output option)

Test Condition Fields

Application Frequency

The number of doses applied during the exposure.

Media Type

Aquatic - Freshwater (FW) tests include those 1) conducted in freshwater, reconstituted water, distilled water, or tap water or 2) the organism habitat is exclusively freshwater. Saltwater (SW) tests include those 1) conducted in natural or artificial seawater, brackish water, or estuarine water or 2) the organism habitat is exclusively saline. If a salinity value of four parts per thousand is reported, it is considered a freshwater test.

Terrestrial - Type of exposure media, (e.g., natural or artificial soil, hydroponic, filter paper). If an aqueous exposure is conducted in pore water from a specific soil, report the soil parameters in the soil characteristics fields (pH, CEC, OM, etc.).

Test Location

Aquatic - A natural (Field N) study is an experiment conducted outdoors in a natural water body or in an artificial water body that has a natural bottom substrate and established aquatic communities (e.g. phytoplankton, zooplankton and fish). Outdoor studies conducted in an artificial water body without a natural bottom substrate are considered artificial studies (Field A). If the water body cannot be determined to be natural or artificial it is coded as field unknown (FieldU). All other studies are considered laboratory (LAB) tests.

Terrestrial - The location or setting in which the experiment was conducted. For example, a natural field study (FieldN) is an experiment conducted outdoors in a natural setting. The test organisms are sampled in the wild, e.g. population counts. Outdoor studies conducted in a simulated environment are coded as an artificial field study (FieldA). Artificial field studies include organisms isolated from their natural environment via an enclosure of some type, e.g. cages or fencing. If the publication does not provide enough information to distinguish between FieldA and FieldN, then use the code FieldU to indicate that the field test type is unknown. Laboratory tests (LAB) are conducted indoors under controlled laboratory conditions.

Exposure Duration

Aquatic - Exposure duration is coded using the units reported in the literature. For a fluctuating or intermittent dosing experiment, the total exposure time is recorded. For delayed effects, report the duration of the entire study.

Terrestrial - The period of time recorded in the data field is the time of actual exposure to the chemical. It is assumed that the exposure duration is equivalent to the longest observation time. In some cases a biological time is used, such as an exposure time reported as "until hatch", "growing season" or "after the nth egg has been laid".

For injection, diet, topical and environmental exposures where the actual exposure is dependent on biological and environmental conditions, the exposure time is recorded as equivalent to the study time.

Study Duration (Terrestrial only)

In cases where the observation time is the only duration reported, it is assumed that the exposure duration is equivalent to the study time.

In some cases a biological time is used, such as an exposure time reported as "until harvest", "growing season" or "after the nth egg has been laid". The term that best describes the authors text is used.

For injection, diet, topical and environmental exposures where the actual exposure is dependent on biological and environmental conditions, the exposure time is recorded as equivalent to the study time.

Exposure Type

Aquatic - Exposures must either be aqueous, through the diet, or by injection. In vitro toxicity test results are not coded.

Terrestrial - The mechanism by which the toxicant was applied. Organisms are typically exposed to toxicants through diet, injection, topical or environmental routes. On occasion, an exposure may be through multiple routes (e.g., such as topical and oral). The terrestrial databases does not include in vitro assays in the database.

Exposure types are searched by major exposure groups. However, a more specific exposure type is displayed in your output (e.g., searching on Intercutaneous is found under the Injection exposure type).

Chemical Analysis

Quantitative analysis of water in test chambers or field sites are considered a measured concentration. Concentrations that are not analyzed in test chambers or field sites are considered unmeasured (nominal).

Application Frequency - The frequency of dosing application is reported

Study Type (Aquatic only)

The study type is used to identify field simulation studies. Examples of field study types include exposures conducted in a mesocosm, microcosm or enclosure.

Control

Control information for the reported effect may be presented in the text, in a graph, or in table format. ECOTOX does not make assessments whether the controls were satisfactory or insufficient (e.g., were replicates run, did control organisms die), but simply document whether the author(s) present information about the type of control that was used.

Dose Number (Terrestrial only)

The total number of exposure doses, including the control(s), for each independent test design is reported in this data field.

Experimental Design

This field is used to code additional study information. For field tests, exposure system dimensions (e.g. pond or lake depth, cage or enclosure size), type of artificial substrate and physical or chemical water chemistry parameters are reported.

For laboratory studies, information about media and test chambers is coded if one of the purposes of the study is to compare results observed under differing test conditions (e.g., pH, temp, humic acid, sediment) or if commercial media types (e.g. Instant Ocean©) were used in the study.

Exposure Sample Number (Terrestrial only)

Sample number reflects the initial sample size for each exposure dose, i.e., the number of test organisms per treatment.

Gender (Terrestrial only)

Identifies the initial sex (ML - Male, FM - Female, BH - Both) of the organism for each exposure level.

Ionic Fraction

For ionizing substances (e.g., metals, ammonia), the dose is reported as the ion, if the concentration presented by the authors is reported as based on the ionic form of the compound (e.g., organotin as Sn). ECOTOX uses standard periodic table symbols.

Dose Statistical Method (Terrestrial only)

The method used to determine the range around the Dose value, if reported by the author(s). The codes standard deviation (SD), standard error (SE), range ®, confidence interval (CI), confidence limits (CL) or confidence value (CV) of the dose value are noted.

Test Result Parameters

Aquatic - A separate line is coded for each effect or endpoint from either a unique experimental design or within one design scenario for statistically defined effects or endpoints. If no statistics are used to distinguish endpoints or effects and experimental designs are similar the data may be combined into one data record. Endpoints always require a discrete line. Emphasis is placed on coding LC50, LD50, EC50 over other regression analyzed endpoints (e.g., EC20, LC100, LD10) when an author reports both endpoints. Effects lacking an author reported endpoint may be combined based on statistical representation by the author. Food chain effects are coded for organisms at the first level of exposure.

Toxicity test results are primarily reported for observations taken during the chemical exposure. However, when results are reported only for the period of time after the

exposure, i.e. recovery or delayed effects, this type of result is noted by using a "~" in conjunction with the endpoint/effect code, e.g., ~MOR for a delayed mortality effect.

Endpoint

Endpoint information is coded if it is reported by the author. For the purposes of ECOTOX, an endpoint is defined as the quantification of an observed effect obtained through statistics or other means of calculation for the express purpose of comparing equivalent effects (e.g., LC50). Many terrestrial plant tests do not have associated endpoints. Prior to 1996, terrestrial plant database structure allowed only results based on percent change from control.

Effect

Effect information must be provided by the author in order for the test to be included. For ECOTOX database purposes, effect is defined as the observation of a response resulting from the action of a chemical stressor (e.g., mortality). The listing of effect measurements can be found by using the Browse Effects index, ECOTOX Code List or ECOTOX Code Appendix (includes many detailed measurement definitions). ECOTOX internally categorizes all observed effects under at least one of ten major effect group codes:

Accumulation (ACC) - Process by which chemicals are taken into and stored in the organism. Includes lethal body burden.

Behavior (BEH) - Activity of an organism represented by three subgroups, avoidance (AVO), general behavior (BEH) and feeding behavior (FDB). All effects related to reproductive behavior are listed under the Reproduction effect group.

Biochemistry (BCM) - Biotransformation or metabolism of chemical compounds, modes of toxic action, and biochemical organism responses. Biochemical has three subgroups, biochemical (BCM), enzyme (ENZ) and hormone (HRM) effects.

Cellular (CEL) - Changes in structure and chemical composition of cells and tissues in organisms. Three cellular subgroups include cellular (CEL) effects, genetics (GEN) and histology (HIS).

Growth (GRO) - Encompasses individual organism weight, length, development and morphology. Development (DVP) covers effects on tissue organization in growing early life stages. Growth (GRO) represents length and weight changes at any point in the life cycle. Morphology (MPH) measurements and endpoints address the structure (bones) and form (organ/tissue development) of an organism at any stage of its life history.

Mortality (MOR) - Death of individuals or measurements that indicate death.

Physiology (PHY) - Basic cell and tissue activities. Subgroups include injury (INJ), immunity (IMM) and intoxication (ITX).

Population (POP) - Effects on species or taxonomic group occupying the same area at a given time.

Reproduction (REP) - Reproductive behavior, physiology, care of progeny and avian/reptile eggs (AEG) measurements. Offspring development effects are found in Growth effect group.

Ecosystem (PRS) - Ecosystem processes include community structure and function. Includes microbial processes.

No Group Code (NOC) - Multiple effects or endpoint lacking a specific effect.

Trend (Aquatic only)

The observed or measured response trend as compared to the control is coded when textually or graphically reported.

Response Site

A response site or tissue code is used to identify specific body, organ or tissue effect sites for associated effect measurement.

EE_Comment (Aquatic only)

This field contains additional endpoint and/or effect text as described by the author. The types of information coded are described in the Aquatic Coding Guidelines

Effect % (Aquatic only)

Effect is reported as a raw percent value or percent change, e.g., percent of the total population or percent increase or decrease. The term "COM" is used to denote several effect measurements or response sites reporting data results as percentages.

Statistical Significance - Statistical analysis as compared to the control(s) in the test result.

Statistical Level

The level of significance (e.g. test statistic) is coded when the author has reported statistical analysis in the test result. Terminology for significance level may be presented as: $p =$; $p <$ or alpha value. The terminology are equivalent and are generally in the range of 0.001 to 0.10.

Bioconcentration (Aquatic only)

The bioconcentration factor (BCF) is a unitless value describing the degree to which a chemical can be concentrated in the tissues of an organism in the aquatic environment (View Endpoint Code List for full definition). A bioconcentration endpoint is coded as either wet (or unknown) or as dry weight (BCF and BCFD, respectively). If the author does not calculate a BCF, the test is recorded as a residue measurement effect with a blank Endpoint and BCF field.

If a BCF is reported for the parent compound and for a metabolite, only the parent compound BCF is reported. Additional information about the BCF is reported, e.g., steady state equilibrium, lipid normalization is noted in the EE_Comment field.

Concentration Type (Aquatic only)

Concentrations based on the active ingredient or formulation, or as the total, un-ionized or dissolved concentration, are identified.

Endpoint Assignment

Used to identify the source of the effect or endpoint information is reported specifically by the author (P) or assigned by an ECOTOX reviewer ®). The reviewer only assigns the endpoint, if the author has provided the statistical analysis that support the endpoint.

Concentration/Dose

The concentration or dose reflects either the range of concentrations tested or if there is and endpoint reported, the concentration associated with the endpoint. The confidence interval or range is recorded when available. If an asterisk (*) denotes the concentration has been recalculated from the author's original units to the standard ug/L or from the metal compound to the active ionic form.

In certain cases, the water concentration is routinely reported as active form of the test chemical. For metal salts, the concentration is generally expressed as ug ion/L (e.g., HgCl is expressed as Hg⁺). Since 1998, the data distinguish between the metal compound and the metal ion in the Ion field. Data encoded prior to this date, may have comments regarding ionic fraction in Comment field.

When an exponential number is reported (e.g., 1 x 10⁶), it is coded as E+n or E-n (e.g., 1 E+6).

Result Sample Number (Terrestrial only)

The sample number reflects the sample size (e.g., 10 embryos) that the observation or response value is based on at each exposure level. Sample units correspond to the sample number; i.e., the unit on which the measurement or endpoint is based.

For generational studies and measurements based on the progeny, F1, F2, etc. are noted in the sample units field.

Observed Duration (Terrestrial only)

The exposure duration when the result value was observed. This may be plus or minus any up to the time at which the response to the toxicant was observed. If the observation time is not reported or unable to be explicitly determined, a less than or equal to (<=) the exposure duration is displayed.

Observations during the pretreatment time are reported as negative values. Report as '-x' any pretreatment response observations for which time is unknown.

Observed Response (Terrestrial only)

Response values may include greater than (>), less than (<), minus (-) or approximation (~) symbols, if used by the author(s). Response values must be numeric and from text or graph.

Result Statistical Method (Terrestrial only)

When the measurement unit includes a standard deviation (SD), standard error (SE), range ®, confidence interval (CI), confidence limits (CL) or confidence value (CV) of the response value are noted.

Result % Dry/Wet Weight (Terrestrial only)

If the effect measurement is based on dry (D) or wet (W) weight basis, it is denoted. The percent moisture is reported, record the percentage value also, e.g. W75%.

Result Percent Lipid (Terrestrial only)

Percent lipid in the whole organism or response site

Water Chemistry Fields (Aquatic only)

These measured values pertain either to the test water chemistry (preferred) or the dilution water chemistry values. If it is necessary to report the dilution water chemistry, this is denoted by an asterisk (*).

Alkalinity - Expressed as mg/L as CaCO₃.

Conductivity - Expressed in mhos/cm (= s/cm).

Dissolved Oxygen - Expressed in mg/L or percent saturation. A "SAT" code denotes 100% saturation.

Hardness - Expressed as mg/L as CaCO₃. If the author only reports the terms "hard" or "soft", these terms are recorded

Organic Carbon Type and Value - Expressed in mg/L as Carbon. (T= total, P= Particulate, D= Dissolved)

pH - pH value

Salinity - Expressed in parts per thousand (ppTH) or as percent seawater.

Temperature - Expressed in degrees Celsius.

Outdoor Test Fields (Aquatic Field Data Only)

Habitat Code

The aquatic field tests include the Cowardin* system level classification to describe major aquatic systems.

*Cowardin, L.M., V.Carter, F.C.Golet and E.T.LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service, FWS/OBS-79, 31 p.
(http://wetlands.fws.gov/Pubs_Reports/Class_Manual/class_titlepg.htm)

Habitat Comment

The author's description of the water body, (e.g. brackish marsh, wooded swamp)

Substrate Code and Comment

The bottom substrate is recorded using standard substrate definitions.

Water Depth - Water depth of the experimental system.

Geographic Code

The standardized name, based on FIPS (Federal Information Processing Standards) code, of the country, or United States and Canadian state/province where the test was performed is displayed. You can view FIPS documentation at:
<http://www.itl.nist.gov/fipspubs/fip10-4.htm>

Geographic Location

Contains general text about the test site specific geographic identifiers (e.g., lake, river, bay, field station or city) where the study was performed.

Longitude/Latitude - The geographic location, latitude and longitude of the test site.

Application Type - The method of application of the chemical in a field study.

Application Rate

This field contains the application rate value and the units. If an exposure concentration is not reported, the application rate must be reported. Application rate units may be recalculated only if the denominator is not equal to one (e.g. 5 g/2.5 ac).

Chemical Half-Life - The test chemical half-life in the system.

Application Date/Season

The application date is recorded the time of initial exposure. This field includes the actual date, a partial date or a season. The format is MO-DA-YR. Examples: 12-01-93, 01-00-75, 00-00-64. If one pond is exposed multiple times, only report the first application date. If the calendar year date is not reported, but a season is, the season (Northern Hemisphere) of initial application of the chemical is reported.

Terrestrial Data Elements**Test Record**

A test record number is used to designate each unique test design. A unique test design may be characterized by a new test chemical, test species, test location, or exposure type. Additionally, there are experimental design parameters that will influence a test scenario sufficiently to warrant an independent test record. Such parameters include tests conducted at different test temperatures or conducted during different seasons.

Test Number

A computer generated number that designates each unique test design. There can be many tests number for each reference number

Exposure Number (Delimited format only)

A sequential number and dose type that identifies each experimental control or dose level. Control values are given the lowest numeric values, the dose values are added sequentially from lowest to highest doses.

Example:

1C = Exposure 1 was the control value

2D = Exposure 2 is the lowest dose value

3D = Exposure 3 is the middle dose value

4D = Exposure 4 is the highest dose value

5R = The exposure values are ranged (low - high)

6E = Only endpoint data are presented in the results.

The exposure dose(s) in the experimental methods are coded, even if the author did not report an effect result for every dose.

Result Record Number (Delimited format only)

A computer generated number that uniquely identifies each result record. There may many result record numbers for each test number.

Test Comment

Additional information related to methodology or techniques used in the experimental design. Appendix H contains header codes used to link the comment to a specific ECOTOX field.

Exposure Comment

Additional information related to dosing methodology or techniques used in the test.

Remark Comment

Additional information related to the endpoint or effect response. Appendix H contains header codes used to link the comment to a specific ECOTOX field.

Soil Parameter Fields (Terrestrial only)**Soil Type**

The classification name of the natural soil or commercial name of the artificial soil used in the study. If the classification name is not included, the type of soil is recorded using the author's terminology, e.g., forest soil, sandy loam soil, arboreal coniferous soil.

Soil Sand %, Soil Silt %, Soil Clay %

The soil texture as stated using percentages of sand, silt and/or clay. Bentonite, kaolinite or montmorillonite etc., are reported as clay.

Soil pH

The pH of the test media are reported. If the pH of the treated media is not presented, but the pH value is stated for the untreated or acclimation media, an asterisk (*) is denoted. If the pH of a specific soil type is not given in the publication, a search is made of the USDA/NRCS National Cooperative Soil Survey (USA) web site, at <http://soils.usda.gov/> may be found for the specific soil series.

Media Organic Matter

If organic matter is reported for the untreated or acclimation media, this will display with an asterisk (*). If the organic matter of a specific soil type is not provided in the publication, information from the USDA/NRCS National Cooperative Soil Survey (USA) online site, is used for the specific soil series.

Media Moisture

The percentage of moisture in the test media is reported. If moisture is reported for the untreated or acclimation media, code this moisture percentage and denote it with an asterisk (*).

Media Cation Exchange Capacity

The media cation exchange capacity is reported. If the cation exchange capacity is reported for the untreated or acclimation media, this value is denoted with an asterisk.

Soil Dose Measured

The toxicant concentration was measured in the soil. However, the exposure dose value may or may not reflect the measured values. The Chemical Analysis field will denote if the exposure dose value is based on the measured values.

Media Measurement (wet/dry)

Denotes whether the soil concentration was reported based on dry (D) or wet (W) weight basis.

APPENDIX F: INDEPENDENTLY COMPILED DATA FILES

Some independently compiled data sets have been transferred into ECOTOX from external sources. The data sets must meet the ECOTOX data parameter and quality assurance guidelines. Data sets available in ECOTOX are:

The U.S. EPA MED data set includes the Acute Toxicity of Organic Chemicals file which contains data for a single test species (30-day fathead minnow). The U.S. EPA Office of Toxic Substances is acknowledged for long-term support in the generation of all acute toxicity data for organic chemicals. All test results, including data not available on-line, have been compiled in five volumes titled: Acute Toxicities of Organic Chemicals to Fathead Minnows (*Pimephales promelas*), available from the Center for Lake Superior Environmental Studies, University of Wisconsin, Superior, WI.

International cooperative efforts are underway with the Organization for Economic Cooperation and Development (OECD) and the Commonwealth of Independent States (Borok Institute) in order to enhance the review of the International literature. Data files from France, Germany, the Netherlands and Russia are received and incorporated into ECOTOX on an ongoing basis.

The Office of Pesticide Program's Pesticide Ecotoxicity Database (formerly Environmental Effects Database) is a compilation of the toxic effects data for registered pesticides. These data have been reviewed and categorized as acceptable for fulfillment of pesticide registration and re-registration guideline requirements as explained under FIFRA Subdivision E, Parts 158.145 and 158.150. Data for the Pesticide Ecotoxicity Database are drawn from several sources. The major portion of the data is derived from actual Agency reviews of toxicological studies conducted by commercial laboratories and submitted by pesticide companies in support of their products. The U.S. EPA conducts audits of these laboratories on a periodic basis through the U.S. EPA Office of Compliance and Monitoring. A second major source of data entries is the numerous studies conducted by U.S. EPA, USDA, and U.S. FWS laboratories over the last 25 years. A third, less utilized source is published data considered to meet our guideline criteria for acceptable data.

The U.S. Geological Survey, Biological Resources Division, Columbia Environmental Research Center (CERC) located in Columbia, Missouri (<http://www.cerc.usgs.gov/data/acute/acute.html>) database summarizes the results from aquatic acute toxicity tests conducted by this research facility. The acute toxicity test provides a relative starting point for hazard assessment of contaminants and is required for federal chemical registration programs such as the Federal Insecticide Fungicide Rodenticide Act (PL 80-104) as amended by the Federal Environmental Pesticide Control Act of 1972 (7 U.S.C. 136-136y) and the Toxic Substances Control Act of 1976 (PL 94-469).

The database was initially developed in 1986 by Foster L. Mayer and Mark R. Ellersieck for 4,901 acute toxicity tests conducted by CERC since 1965 with 410

chemicals and 66 species of aquatic animals. A report by Mayer and Ellersieck (1986) provides an interpretation of the original 4,901 toxicity tests which utilizes various statistical approaches to make taxonomic comparisons, and to assess the degree to which various factors (static versus flow-through, age of test solutions, pH, temperature, water hardness, and diet) affect toxicity (*Manual of Acute Toxicity: Interpretation and Data Base for 410 Chemicals and 66 Species of Freshwater Animals*, F.L. Mayer and M.R. Ellersieck, United States Department of the Interior, U.S. Fish and Wildlife Service, Resource Publication 160, 1986). This publication is commonly referred to as the "Gold Book".

The available data sets, available data, institution address and contacts are listed below:

| Institution Contact Information | Data Summary and Reference Numbers |
|---|--|
| <p>EPA: Fathead Minnow Acute Toxicity Database (MED)</p> <p>To obtain hard copies of the University of Wisconsin-Superior (UWS) volumes contact:</p> <p>University of Wisconsin/ Lake Superior Research Institute
 Contact: Dianne Brooke
 E-mail: dbrooke@staff.uwsuper.edu
 Phone: 715-394-8166</p> <p>For technical information on the database contact:</p> <p>U.S. EPA/ORD/NHEERL/MED
 Contact: Christine Russom
 E-mail: russom.chris@epa.gov</p> | <p>5 references (#3217, 12447, 12448, 12858, 12859);</p> <p>724 aquatic records</p> |
| <p>French (OECD-IRCHA)
 Ecotoxicology Department, INERIS
 Rue Lavoisier, B.P. 1
 F-91710 Vert Le Petit
 France
 http://www.ineris.fr/en/index.htm
 Contact: Dr. Roger Cabridenc
 Phone: 33-1-45960956; Fax: 33-1-45960957</p> | <p>13 references (#20, 3397, 3516, 3517, 3518, 3519, 3520, 3521, 5161, 6771, 9170, 10724, 15300);</p> <p>256 aquatic records</p> |
| <p>German (OECD)
 Umweltbundesamt, Federal Environmental Agency
 Dienstgebäude Berlin-Mitte
 Mauerstraße 45-52
 0-1080 Berlin Germany
 http://www.umweltbundesamt.de/index-e.htm
 Contact: Ms. Cornelia Leuschner
 Phone: 49-30-89033219; Fax: 49-30-89033232
 E-mail: cornelia.leuchner@uba.de</p> | <p>282 references (citation refers to OECDG Database);</p> <p>8218 aquatic records
 941 terrestrial records</p> |

| Institution Contact Information | Data Summary and Reference Numbers |
|--|--|
| <p>Dutch (OECD)
 National Institute of Public Health and Environmental Protection (RIVM/ACT)
 PO Box 1, 3720 BA Bilthoven
 The Netherlands
 http://arch.rivm.nl/index_en.html
 Contact: Dr. Hans Canton
 E-mail: ecocr@sb615.rivm.nl</p> | <p>17 references (#5180, 5331, 5333, 5336, 5337, 5356, 5367, 5370, 5374, 5375, 5378, 5390, 5400, 5411, 5414, 11039, 11044);

 1990 aquatic records</p> |
| <p>Russia
 Borok Institute, Institute for Biology of Inland Waters,
 Academy of Sciences
 152742 Borok, Nekouz, Yaroslavlsky Region
 Russian Republic
 http://www.ibiw.yaroslavl.ru/
 Contact: Victor Komov
 E-mail: vkomov@ibiw.yaroslavl.su</p> | <p>55 references

 255 aquatic records</p> |
| <p>EPA: Office of Pesticides Program Database (OPP)
 (Pesticide Ecotoxicity Database -formerly Ecological Effects Database)
 U.S. Environmental Protection Agency
 Office of Pesticide Programs
 Environmental Fate and Effects Division,
 Ecological Effects Branch
 401 M St. SW
 Washington, DC 20460
 http://www.epa.gov/oppefed1/general/databasesdescription.htm#ecotoxicity
 Contact: Brian Montague
 E-mail: montague.brian@epa.gov</p> | <p>1 reference (#344);

 5593 aquatic records,
 4377 terrestrial records</p> |
| <p>USGS Acute Toxicity Database (Mayer & Ellersieck, 1986 - commonly referred to as the "Gold Book")</p> <p>For data format questions contact:
 Columbia Environmental Research Center
 U.S. Geological Survey
 4200 New Haven Road, Columbia, Missouri 65201
 Phone: 573-875-5399
 (http://www.cerc.usgs.gov/data/acute/acute.html)
 Contact: Linda Sappington
 E-mail: linda_sappington@usgs.gov</p> <p>For data interpretation contact:
 National Health and Environmental Effects Research Laboratory
 U.S. Environmental Protection Agency - Gulf Ecology Division
 Gulf Breeze, Florida 32561
 Phone: 850-934-9356
 Contact: Foster L Mayer
 E-mail: mayer.foster@epa.gov</p> | <p>1 reference (#6797);

 8761 aquatic records</p> |

APPENDIX G: DEFAULT REPORT FORMATS

Aquatic Browser Viewable Report



U.S. Environmental Protection Agency

ECOTOX: Aquatic Report

USEPA/ORD/NHEERL - Mid-Continent Ecology Division

E-mail: ecotox.support@epa.gov

Telephone: 218-529-5225

It is recommended that users consult the original scientific paper to ensure an understanding of the context of the data retrieved from the ECOTOX database.

Aquatic Search Results:
426 Records

1 2 3 4 5 6 Next>> [References](#)

Page 1 of 7

| <u>Scientific name.</u>
<u>Common name</u> | <u>Effect</u>
<u>Meas</u> | <u>Endpoint</u>
<u>BCF</u> | <u>Resp Site</u>
<u>Dur (Days)</u> | <u>Conc</u>
<u>Type</u>
<u>Conc Unit</u> | <u>Trend</u>
<u>Eff %</u> | <u>Signif</u>
<u>Level</u> | <u>Expo</u>
<u>Type</u>
<u>Chem</u>
<u>Anal</u>
<u>Meth</u> | <u>Media</u>
<u>Type</u>
<u>Loc</u> | <u>Ref Num</u> | <u>View</u>
<u>Details</u> |
|---|------------------------------|-------------------------------|---------------------------------------|--|------------------------------|-------------------------------|---|---|----------------|----------------------------------|
| CAS #/Chemical: 50000 Formalin | | | | | | | | | | |
| Algae, Moss, Fungi | | | | | | | | | | |
| Saprolegnia sp.
Fungi | ~POP
PGRT | LOEC | _____ | A 300000
ug/L | DEC | _____ | S
U | FW
LAB | 16533 | View
Details |
| Aphanomyces astaci
Water mold | ~REP
GERM | LD50 | _____1 | F (>20/ -
<40/)
mg/L | DEC | NA
NA | S
U | FW
LAB | 17271 | View
Details |
| Aphanomyces astaci
Water mold | ~REP
GERM | LD50 | _____1 | F ~ 20/
mg/L | DEC | NA
NA | S
U | FW
LAB | 17271 | View
Details |

Terrestrial Browser Viewable Full Record



U.S. Environmental Protection Agency

ECOTOX: Terrestrial Report

USEPA/ORD/NHEERL - Mid-Continent Ecology Division

E-mail: ecotox.support@epa.gov

Telephone: 218-529-5225

It is recommended that users consult the original scientific paper to ensure an understanding of the context of the data retrieved from the ECOTOX database.

Terrestrial Search Results:
14 Test Records

1 [Next>>](#)

[References](#)

Page 1 of 2

A study of **4 year(s)** duration using **natural soil** media was conducted in a **FieldN** site location with **not reported** obtained ***Pisum sp.* (pea)**. The organism(s) (age: **NR NR** and organism characteristics of: **Var. Smaragd**) were exposed for a duration of **NA harvest** to a(n) **1 dosed x time(s) per study period** application of **Barium chloride** (CAS # **10361372**) in **NR** carrier or a(n) **NR** positive control through a(n) **direct application** exposure route. The reported chemical concentrations are the result of **measured** analysis of chemical solutions and are based on the **Ba** ion. The **natural soil** was comprised of **20%** sand, **20%** silt, **20%** clay, pH **NR**, and **NR%** organic matter, **NR%** moisture and **NR NR** CEC. The concentrations are based on **NR** soil weight and are the result of **measured** analysis of the chemical concentration in soil. (Reference 44581, Nyarai-Horvath, F., T. Szalai, I. Kadar, and P. Csatho, Test Number 47185).

Test Comments: EXPO INFO/EDES/SOIL DOSED IN 1991 AND SUCCESSIVE CROPS GROWN UNTIL 1994.//

Exposure Comments: 2 REPLICATES, YR EFCTS, BA CONC. IN SOIL FOUR YEARS AFTER APPLICATION//

Effect of **Barium chloride** on *Pisum* sp. **Growth**

| Sample Unit | Effect Measurement | Response Site | Observation Duration | Concentration / Dose | | | |
|-------------|--------------------|---------------|----------------------|----------------------|-----------|-----------|-----------|
| | | | | 18 mg/kg | 27 mg/kg | 40 mg/kg | 67 mg/kg |
| NR NR | Biomass | Grain | NR-NR harvest | 2.51 t/ha | 2.19 t/ha | 2.50 t/ha | 2.81 t/ha |

Effect of **Barium chloride** on *Pisum* sp. **Mortality**

| Sample Unit | Effect Measurement | Response Site | Observation Duration | Concentration / Dose | | | |
|-------------|--------------------|---------------|----------------------|----------------------|----------|----------|----------|
| | | | | 18 mg/kg | 27 mg/kg | 40 mg/kg | 67 mg/kg |
| NR NR | Survival | Not Reported | 8 day(s) | 7 % | 6 % | 7 % | 8 % |

APPENDIX H: COMMENT FIELD HEADER NAMES**Aquatic Comment Abbreviations**

Comment headers codes are used to link additional data provided to the primary database field.

| Header Abbreviation | Associated Field Name |
|----------------------------|------------------------------|
| ALK | Alkalinity |
| AP TY | Application Type |
| AP SEAS | Application Season |
| AP DATE | Application Date |
| AP RATE | Application Rate |
| AP FREQ | Application Frequency |
| BCF | Bioconcentration |
| CARRIER | Carrier or Solvent |
| CHAR | Chemical Comment |
| CONC | Concentration |
| COND | Conductivity |
| CONTR | Control |
| DEPTH | Water Depth |
| DO | Dissolved Oxygen |
| FO | Chemical Formulation |
| FW,SW | Exposure Media |
| GRADE | Grade |
| HAB | Habitat Description |
| HALF | Half Life |
| HARD | Hardness |
| In EE Comment | Endpt (Endpoint) |
| In EE Comment | Measurement |
| In EE Comment | Effect |
| LAB,FIELD | Location |
| LAT | Latitude |
| LEVEL | Statistical Level |

| Header Abbreviation | Associated Field Name |
|----------------------------|---------------------------------|
| LIFESTG | Organism Lifestage |
| LOC | Location |
| LONG | Longitude |
| ORG C | Organic Carbon |
| PH | pH |
| PURITY | Purity |
| RADIO | Chemical Radiolabel |
| SALIN | Salinity |
| SIGNIF | Significance |
| SITE | Response Site |
| SOLVCHAR | Chemical Carrier
Comment |
| SOLVFO | Chemical Carrier
Formulation |
| SOLVGRADE | Chemical Carrier Grade |
| SOLVPURITY | Chemical Carrier Purity |
| SUBSTR | Substrate Comment |
| TEMP | Temperature |
| TIME | Exposure Time |
| TREND | Trend |
| TYPE | Exposure Type |

Terrestrial Comment Abbreviations

Comment headers codes are used to link additional data provided to the primary database field.

| Header Abbreviations | Associated Field Name |
|-----------------------------|--------------------------------|
| ANALYSIS | Chemical Analysis |
| AP FREQ | Application Frequency |
| CEC | Media Cation Exchange Capacity |
| CHAR | Chemical Comments |
| CONTR | Control |
| DNUM | Number of Doses |
| DOSE/ DUNIT | Exposure Dose and Unit |
| DW | Dry or Wet Weight |
| EDES | Experimental Design |
| EFCT | Effect |
| ENDPT | EndpointAssigned |
| ETIME | Exposure Duration |
| FO | Chemical Formulation |
| ION | Ionic Fraction |
| LD | Percent Lipid |
| LIFESTG/ AGE | Lifestage/Age |
| LOC | Test Location |
| MEDIA | Media Type |
| MOIST | Media Moisture |
| MSMT | Effect Measurement |
| OCHAR | Organism Comment |
| OEF | Other Effects |
| OM | Media Organic Matter |
| OTIME | Observation Time |
| PC, CARRIER | Chemical Name, Type |

| Header Abbreviations | Associated Field Name |
|-----------------------------|----------------------------------|
| pH | Media pH |
| RADIO | Chemical Radiolabel |
| RSITE | Response Site |
| RVALUE
RUNIT | Observed Response
Value/ Unit |
| SAMPN/ NUNIT | Sample Number and Unit |
| SEX | Gender |
| SIGNIF | Statistical Significance |
| SOIL | Soil Type |
| SOURCE | Organism Source |
| STIME | Study Duration |
| TEXTURE | Soil Texture |
| TYPE | Exposure Type |

APPENDIX I: DELIMITED OUTPUT HEADER NAMES**Aquatic Report Output Codes**

A forward slash (/) within a field refers to an associated comment in a separate field. You will need to view the full publication for proper interpretation.

Note: OP = Operator (>, >=, <, =<, =)

| Web Page Report Header | Delimited File Header Name | Header Name Definition |
|---|---------------------------------------|---|
| Alkalinity (7 fields) | Alkalinity Mean Op | Alkalinity Mean Operator |
| | Alkalinity Mean | Alkalinity Mean value |
| | Alkalinity Min Op | Alkalinity Minimum Operator |
| | Alkalinity Min | Alkalinity Minimum Value |
| | Alkalinity Max Op | Alkalinity Maximum Operator |
| | Alkalinity Max | Alkalinity Maximum Value |
| | Alkalinity Units | |
| Appl. Freq | Application Frequency | |
| Appl Rate (2 fields) | Application Rate
Application Units | |
| Appl Type | Application Type | |
| Author | Author | |
| BCF (12 fields)

Note: The Concentration Type determines the fraction measured in BCF1 and BCF 2. | BCF1 Mean Op | First Bioconcentration Factor Mean Operator |
| | BCF1 Mean | First Bioconcentration Factor Mean Value |
| | BCF1 Min Op | First Bioconcentration Factor Minimum Operator |
| | BCF1 Min | First Bioconcentration Factor Minimum Value |
| | BCF1 Max Op | First Bioconcentration Factor Maximum Operator |
| | BCF1 Max | First Bioconcentration Factor Maximum Value |
| | BCF2 Mean Op | Second Bioconcentration Factor Mean Operator |
| | BCF2 Mean | Second Bioconcentration Factor Mean |
| | BCF2 Min Op | Second Bioconcentration Factor Minimum Operator |

| Web Page Report Header | Delimited File Header Name | Header Name Definition |
|------------------------|--|---|
| | BCF2 Min | Second Bioconcentration Factor Minimum Value |
| | BCF2 Max Op | Second Bioconcentration Factor Maximum Operator |
| | BCF2 Max | Second Bioconcentration Factor Maximum Value |
| CAS# | CAS# | Chemical Abstract Services Registry Number |
| Chem Comment | Chem Comment | Chemical Comment |
| Chemical | Chemical Name | |
| Chem Method | Chem Method | Chemical Analysis Method |
| Common Name | Common Name | Species Common Name |
| Conc (15 fields) | Concentration1 Mean Op | First Concentration Mean Operator |
| | Concentration1 Mean | First Concentration Mean Value |
| | Concentration1 Min Op | First Concentration Minimum Operator |
| | Concentration1 Min | First Concentration Minimum Value |
| | Concentration1 Max Op | First Concentration Maximum Operator |
| | Concentration1 Max | First Concentration Maximum Value |
| | Concentration Type1 | First Concentration Type |
| | Concentration2 Mean Op | Second Concentration Mean Operator |
| | Concentration2 Mean | Second Concentration Mean Value |
| | Concentration2 Min Op | Second Concentration Minimum Operator |
| | Concentration2 Min | Second Concentration Minimum Value |
| | Concentration2 Max Op | Second Concentration Maximum Operator |
| | Concentration2 Max | Second Concentration Maximum Value |
| | Concentration Type 2 | Second Concentration Type |
| | Concentration Units | |
| Date/Season (2 fields) | Application Date
Application Season | |
| Doc Code | Doc Code | Documentation Code |
| Effect | Effect | |
| Effect Measurement | Effect Measurement | |

| Web Page Report Header | Delimited File Header Name | Header Name Definition |
|---------------------------|----------------------------|------------------------------|
| Effect Percent (3 fields) | Effect Percent Mean | Effect Percent Mean Value |
| | Effect Percent Min | Effect Percent Minimum Value |
| | Effect Percent Max | Effect Percent Maximum Value |
| Endpoint | Endpoint | |
| Eff & Endpnt Comment | Eff & Endpnt Comment | Effect Endpoint Comment |
| Exp. Design Comment | Exp. Design Comment | Experimental Design Comment |
| Dur (7 fields) | Test Duration Op | Test Duration Operator |
| | Test Duration | Test Duration Value |
| | Min Duration Op | Minimum Duration Operator |
| | Min Duration | Minimum Duration Value |
| | Max Duration Op | Maximum Duration Operator |
| | Max Duration | Maximum Duration Value |
| | Duration Units | |
| Exp Type | Exposure Type | |
| Geo Locat | Geo Locat | Geographic Location text |
| Geo Code | Geographic Code | |
| Habit Code | Habit Code | Habitat Code |
| Habit Comment | Habit Comment | Habitat Comment |
| Hardness (mg/L)(7 fields) | Hardness Mean Op | Hardness Mean Operator |
| | Hardness Mean | Hardness Mean Value |
| | Hardness Min Opr | Hardness Minimum Operator |
| | Hardness Min | Hardness Minimum Value |
| | Hardness Max Op | Hardness Maximum Operator |
| | Hardness Maximum | Hardness Maximum Value |
| | Hardness Units | |
| Ion | Ionic Fraction | |
| Lat/Long | Latitude/Longitude | |
| Level | Level | Statistical Level |
| Lifestage | | |
| Media Type | Media Type | |

| Web Page Report Header | Delimited File Header Name | Header Name Definition |
|-------------------------------|---------------------------------------|--|
| Organic C (mg/L)(8 fields) | Organic Carbon Mean Op | Organic Carbon Mean Operator |
| | Organic Carbon Mean | Organic Carbon Mean Value |
| | Organic Carbon Min Op | Organic Carbon Minimum Operator |
| | Organic Carbon Min | Organic Carbon Minimum Value |
| | Organic Carbon Max Op | Organic Carbon Maximum Operator |
| | Organic Carbon Maximum, | Organic Carbon Maximum Value |
| | Organic Carbon Units | |
| | Organic Carbon Type | |
| Org. Comment | Organism Comment | |
| pH (7 fields) | pH Mean Op | pH Mean Operator |
| | pH Mean | pH Mean Value |
| | pH Min Op | pH Minimum Operator |
| | pH Min | pH Minimum Value |
| | pH Max Op | pH Maximum Operator |
| | pH Maximum | pH Maximum Value |
| | pH Units | |
| Ref # | Ref # | Reference Number |
| Reference Citation (4 fields) | Author
Title
Year
Ref Source | |
| Ref Source | Ref Source | Bibliographic Citation for Publication |
| Response Site | Response Site | |
| Salinity (ppth) (7 fields) | Salinity Mean Op | Salinity Mean Operator |
| | Salinity Mean | Salinity Mean Value |
| | Salinity Min Op | Salinity Minimum Operator |
| | Salinity Minimum, | Salinity Minimum Value |
| | Salinity Max Op | Salinity Maximum Operator |
| | Salinity Max | Salinity Maximum Value |
| | Salinity Units | |
| Scientific Name | Scientific Name | Species Scientific Name |
| Signif | Significant | Statistical Significance |

| Web Page Report Header | Delimited File Header Name | Header Name Definition |
|------------------------|----------------------------|------------------------------|
| Species # | Species # | Species Number |
| Study Type | Study Type | |
| Substr Code | Substrate Code | |
| Temp (C) (7 fields) | Temp Mean Op | Temperature Mean Operator |
| | Temp Mean | Temperature Mean Value |
| | Temp Min Op | Temperature Minimum Operator |
| | Temp Min | Temperature Minimum Value |
| | Temp Max Op | Temperature Maximum Operator |
| | Temperature Max | Temperature Maximum Value |
| | Temp Units | Temperature Units |
| Test # | Test # | Test Number |
| Test Loc | Test Loc | Test Location |
| Title | Title | Title of the Publication |
| Trend | Trend | |
| Year | Year | Publication Year |

Terrestrial Delimited Report Output Codes

A forward slash (/) within a field refers to an associated comment in a separate field. You will need to view the full publication for proper interpretation.

Note: OP = operator (>, >=, <, =<, =)

| Delimited Header Name | Delimited Header Definition |
|----------------------------|---|
| Application Frequency | |
| Application Frequency Unit | |
| Assign | Reviewer Assigned Endpoint |
| Author | |
| CAS#, | Test Chemical Abstracts Service Registry Number |
| Carrier1 | First Carrier Chemical Name |
| Carrier2 | Second Carrier Chemical Name |
| Carrier3 | Third Carrier Chemical Name |
| Carrier1 CAS# | First Carrier Chemical Abstracts Service Registry Number |
| Carrier2 CAS#, | Second Carrier Chemical Abstracts Service Registry Number |

| Delimited Header Name | Delimited Header Definition |
|-----------------------------|---|
| Carrier3 CAS# | Second Carrier Chemical Abstracts Service Registry Number |
| Chemical Analysis Method | |
| Chemical Comment | |
| Chemical Grade | |
| Chemical Formulation | |
| Chemical Name | Test Chemical Name |
| Chemical Purity | |
| Common Name | Species Common Name |
| Concentration/Dose Mean Op | Concentration/Dose Mean Operator |
| Concentration/Dose Mean | Concentration/Dose Mean Value |
| Concentration/Dose Min Op | Concentration/Dose Minimum Operator |
| Concentration/Dose Min | Concentration/Dose Minimum Value |
| Concentration/Dose Max Op | Concentration/Dose Maximum Operator |
| Concentration/Dose Max | Concentration/Dose Maximum Value |
| Dose Statistical Method | |
| Concentration/Dose Value Op | Concentration/Dose Statistical Method Operator |
| Concentration/Dose Value | Concentration/Dose Statistical Method Value |
| Concentration/Dose Units | |
| Control Type | |
| Doc Code | Documentation Code |
| Dose Number | |
| Effect | |
| Effect Measurement | |
| Endpoint | |
| Exp Typ | Exposure Type |
| Exposure Comment | |
| Exposure Mean Op | Exposure Duration Mean Operator |
| Exposure Mean | Exposure Duration Mean Value |
| Exposure Min Op | Exposure Duration Minimum Operator |
| Exposure Min | Exposure Duration Minimum Value |
| Exposure Max Op | Exposure Duration Maximum Operator |

| Delimited Header Name | Delimited Header Definition |
|------------------------------|---------------------------------------|
| Exposure Max | Exposure Duration Maximum Value |
| Exposure Duration Units | |
| Exposure Number | |
| Gender | |
| Ion | Ionic Fraction |
| Lifestage | |
| Media Measurement (wet/ dry) | Basis of Measurement (wet/dry) |
| Media Moisture Mean Op | Media Moisture Mean Operator |
| Media Moisture Mean | Media Moisture Mean Value |
| Media Moisture Min Op | Media Moisture Minimum Operator |
| Media Moisture Min | Media Moisture Minimum Value |
| Media Moisture Max Op | Media Moisture Maximum Operator |
| Media Moisture Max | Media Moisture Maximum Value |
| Media Organic Matter Mean Op | Media Organic Matter Mean Operator |
| Media Organic Matter Mean | Media Organic Matter Mean Value |
| Media Organic Matter Min Op | Media Organic Matter Minimum Operator |
| Media Organic Matter Min | Media Organic Matter Minimum Value |
| Media Organic Matter Max Op | Media Organic Matter Maximum Operator |
| Media Organic Matter Max | Media Organic Matter Maximum Value |
| Media Organic Matter Units | |
| Media Type | |
| Observation Duration Mean Op | Observation Duration Mean Operator |
| Observation Duration Mean | Observation Duration Mean Value |
| Observation Duration Min Op | Observation Duration Minimum Operator |
| Observation Duration Min | Observation Duration Minimum Value |
| Observation Duration Max Op | Observation Duration Maximum Operator |
| Observation Duration Max | Observation Duration Maximum Value |
| Observation Duration Unit | |
| Observed Response Mean | Observed Response Mean Value |
| Observed Response Min | Observed Response Minimum Value |

| Delimited Header Name | Delimited Header Definition |
|---------------------------|---|
| Observed Response Max | Observed Response Maximum Value |
| Observed Response Value | Observed Response Statistical Method Value |
| Organism Comment | |
| Organism Age | |
| Organism Age Units | |
| Organism Source | |
| Percent Lipid | Result Percent Lipid |
| Pos Control | Positive Control Chemical Name |
| Pos Control CAS# | Positive Control Chemical Abstracts Service Registry Number |
| Ref # | Reference Number |
| Response Mean Op | Observed Response Mean Operator |
| Response Min Op | Observed Response Minimum Operator |
| Response Max Op | Observed Response Maximum Operator |
| Response Site | |
| Response Units | Observed Response Units |
| Result Comment | |
| Result % dry/wet Weight | |
| Result Record Number | |
| Result Set Number | |
| Result Statistical Method | |
| Sample Unit | Result Unit |
| Sample Total | |
| Scientific Name | Species Scientific Name |
| Significance Level | |
| Significant | Significance |
| Soil Dose Measured | |
| Soil Clay % Mean Op | Soil Clay % Mean Operator |
| Soil Clay % Mean | Soil Clay % Mean Value |
| Soil Clay % Min Op | Soil Clay % Minimum Operator |
| Soil Clay % Min | Soil Clay % Minimum Value |
| Soil Clay % Max Op | Soil Clay % Maximum Operator |

| Delimited Header Name | Delimited Header Definition |
|-----------------------|---------------------------------|
| Soil Clay % Maximum | Soil Clay % Maximum Value |
| Soil Sand % Mean Op | Soil Sand % Mean Operator |
| Soil Sand % Mean | Soil Sand % Mean Value |
| Soil Sand % Min Op | Soil Sand % Minimum Operator |
| Soil Sand % Min | Soil Sand % Minimum Value |
| Soil Sand % Max Op | Soil Sand % Maximum Operator |
| Soil Sand % Max | Soil Sand % Maximum Value |
| Soil Silt % Mean Op | Soil Silt % Mean Operator |
| Soil Silt % Mean | Soil Silt % Mean Value |
| Soil Silt % Min Op | Soil Silt % Minimum Operator |
| Soil Silt % Min | Soil Silt % Minimum Value |
| Soil Silt % Max Op | Soil Silt % Maximum Operator |
| Soil Silt % Max | Soil Silt % Maximum Value |
| Soil pH Mean Op | Soil pH Mean Operator |
| Soil pH Mean | Soil pH Mean Value |
| Soil pH Min Op | Soil pH Minimum Operator |
| Soil pH Min | Soil pH Minimum Value |
| Soil pH Max Op | Soil pH Maximum Operator |
| Soil pH Max | Soil pH Maximum Value |
| Soil Type | |
| Species # | Species Number |
| Study Mean Op | Study Duration Mean Operator |
| Study Mean | Study Duration Mean Value |
| Study Min Op | Study Duration Minimum Operator |
| Study Min | Study Duration Minimum Value |
| Study Max Op | Study Duration Maximum Operator |
| Study Max | Study Duration Maximum Value |
| Study Duration Unit | |
| Test Comment | |
| Test Loc | |
| Test Number | |

| Delimited Header Name | Delimited Header Definition |
|-----------------------|-----------------------------|
| Title | Title of Publication |
| Year | Publication Year |